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AUTHOR	Summer, Gail L.; Giovannini, Kathleen
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ABSTRACT

This teaching guide on earth sciences for 4-year-olds is based on a modification of the "Plan, Do, Review" approach to education devised by High Scope in Ypsilanti, Michigan. First implemented as an outreach early childhood program in North Carolina, the science activities described in this guide can be adapted to various early childhood environments. All activities described in the curriculum's sessions are hands-on and manipulative, based on the understanding that young children learn through doing. The four sessions in this guide for 4-year-olds cover: (1) air takes up space; (2) water has special characteristics; (3) some rocks are fossils; and (4) it is important to keep natural resources clean. Each session begins with group time and a story to introduce the science concept for that session. Children are then introduced to all the possible activities for the session. As the activities are explained, materials are placed in learning centers around the room. Children then choose and complete activities in the centers, with adults "floating" from center to center engaging children in questions intended to enhance their understanding. Sessions are completed with a group review time. Resource kits or enrichment activities are included with each session, and masters of patterns that may be needed for enrichment activities are included, along with lists of suggested books, fingerplays, and songs that infuse science concepts throughout children's day. (EV)

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Gail L. Summer
Kathryn L. Battillo Fisher

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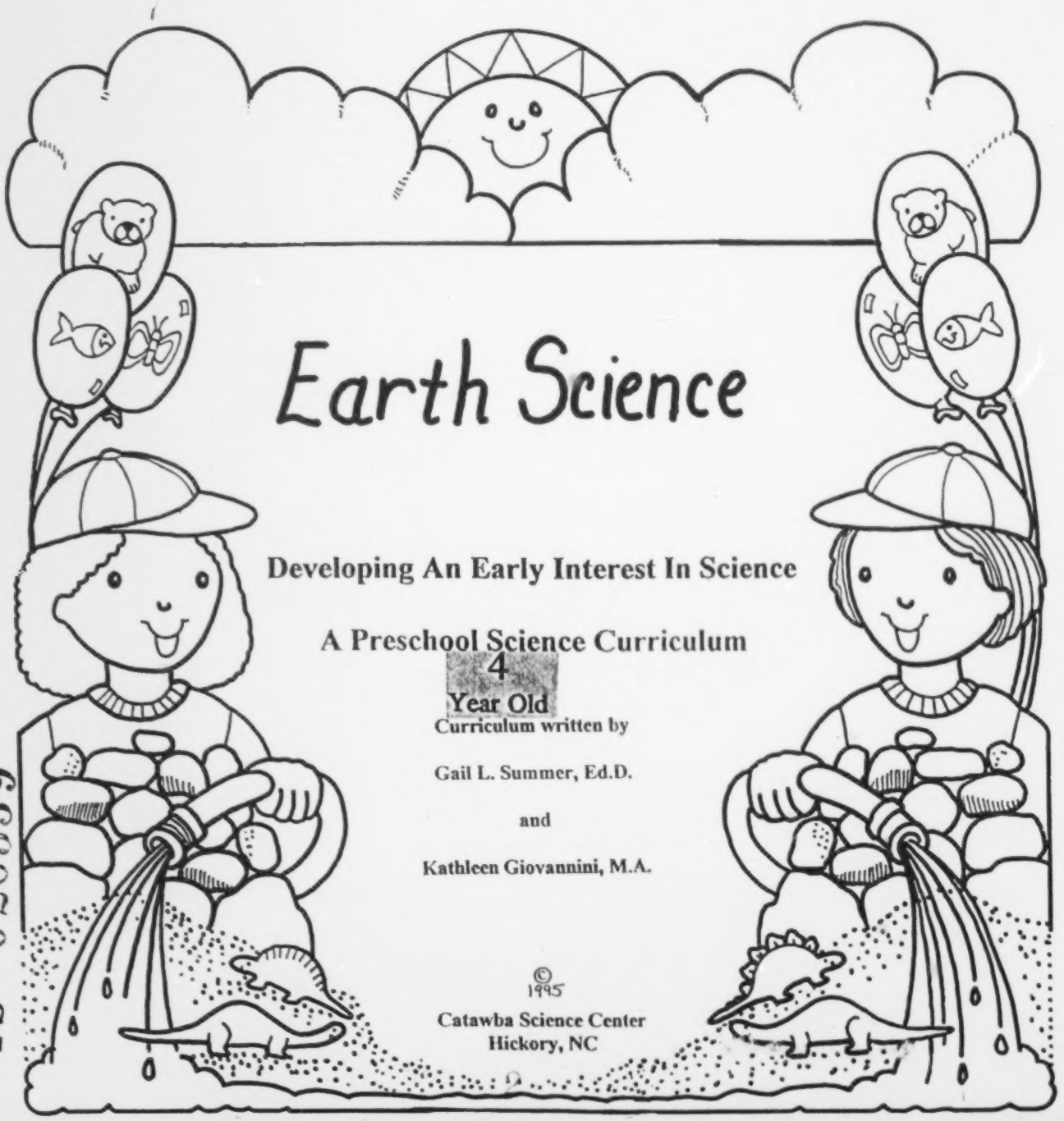

Earth Science

Developing An Early Interest In Science

A Preschool Science Curriculum

4 Year Old

Curriculum written by

Gail L. Summer, Ed.D.

and

Kathleen Giovannini, M.A.

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1995

Catawba Science Center
Hickory, NC

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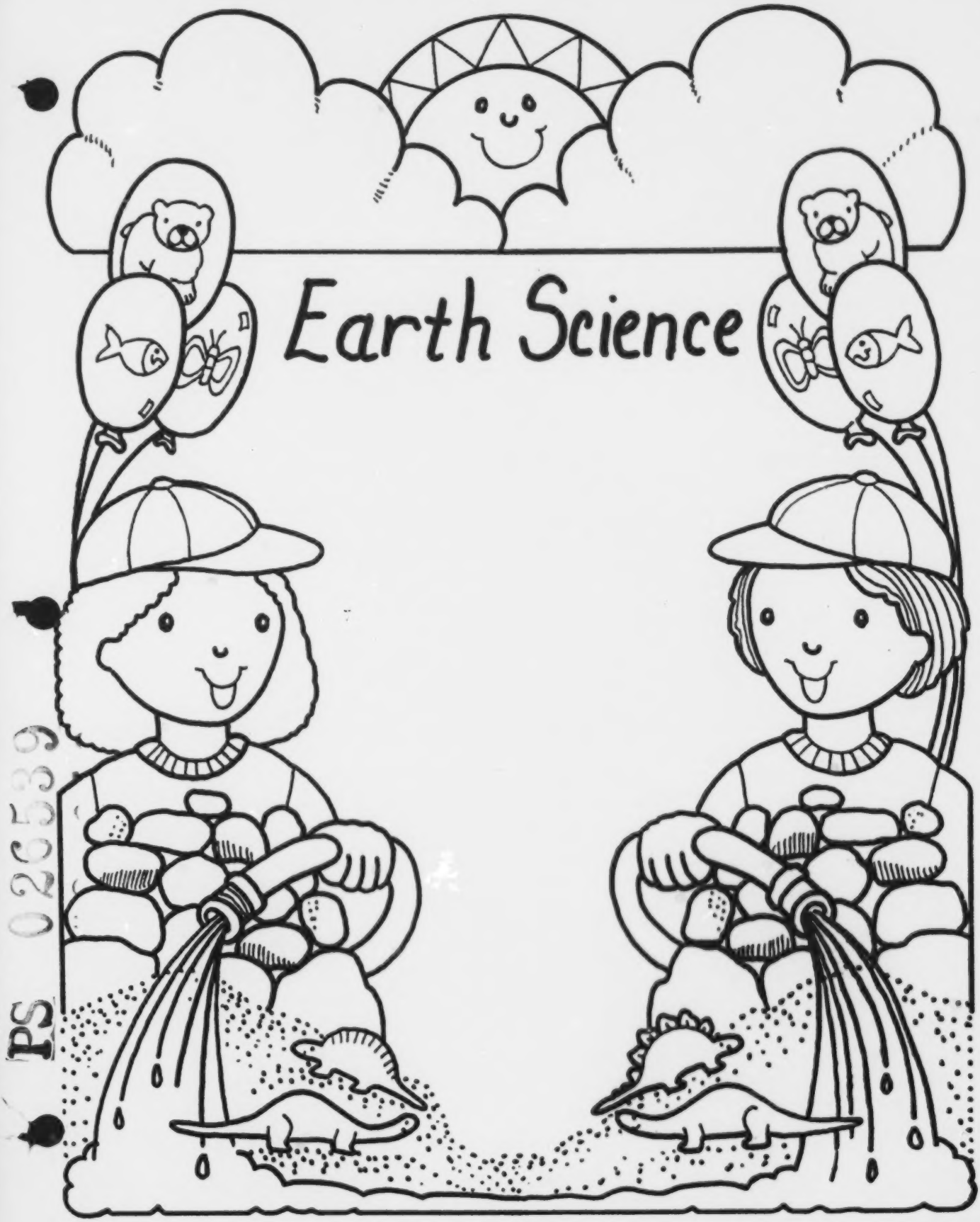

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Introduction

Philosophy

Developing an Early Interest in Science has been designed to not only develop an early interest in and enthusiasm for science, but also to excite young children about learning and discovering in general. While science is the content, the approach with which that content is presented is crucial to the success of developing an early interest in science and learning.

The young child learns in unique ways. The young child must experience science concepts. Simply talking about scientific concepts doesn't allow the child to understand and therefore attach meaning to the concepts. Perhaps the old Chinese Proverb, "I hear and I forget; I see and I remember; I do and I understand" is a good reminder of how the young child needs to experience the world. Doing is the key.

Given how the young child learns, **Developing an Early Interest in Science** is based on a modification of the Plan, Do, Review approach devised by High Scope in Ypsilanti, Michigan. The Plan, Do, Review approach introduces the concept and choices for the day, then allows each child to "plan" their activities by stating their choices for that day. After each child "plans," each implements his/her plan by "doing," or engaging in the activities selected. While the children are "doing," the teachers are interacting with them, asking questions to further elaborate the learning. After "doing," the children regroup and "review" by sharing what they did while interacting with the activities that day. The purpose of the Plan, Do, Review approach is to allow children control over their learning, while still holding them responsible for what they are learning.

Program Description

Developing an Early Interest in Science has been designed to be an outreach early childhood program. In its original form, a science educator from the Catawba Science Center in Hickory, NC visited child care/early childhood programs on a bi-weekly schedule. With each visit, one session was shared with the children. Teachers in the child care programs participated in training workshops prior to each new unit (units consisted of 4-6 sessions). The purpose of the workshops was for the teachers to make resource activities they used in their classroom after the session and to also gain an understanding of the concepts to be better able to assist the science educator while she was in their classroom.

Replication of the program in its original form is possible, but variations are also possible. The sessions could be presented at a science center with the children travelling to the museum rather than the educator travelling out to the children. The sessions may also be presented to small groups of parents and their preschoolers at a science museum for a brief morning session, somewhat similar to the library story hour idea enjoyed by parents and preschoolers for years. The sessions are also easily adaptable by teachers in child development centers for use in their own classrooms. Each session provides suggestions for numerous center ideas to enrich science activities throughout the preschool curriculum. With a little flexibility, the curriculum presented here can fit many formats and needs.

Session Description

In **Developing an Early Interest in Science,** each session begins with a circle or group time, with a song to say hello to everyone, and a story to introduce the concept for that

session. Children are then introduced to all the possible activities for the session. As the activities are shared, they are placed in learning centers around the room. After the activities are all introduced, and the children have watched where each has been placed in the learning centers, the children "plan" as they are asked one by one what they would like to do during that day's session. (This whole introductory process takes about 10 minutes.)

As children make choices, they are dismissed from the circle to begin the "do" part of the cycle by engaging in their choices in the learning centers. Adults join the children in their activity in centers by floating from center to center to engage children in questions which enhance their activity and understanding. As children complete one activity, they may choose another activity in their plan. Children are not expected to rotate through the activities on an adult schedule or in groups of prearranged partners. Some children may only complete one activity during a session due to total engagement with that activity, and that's just fine. Other children may complete several activities and that's acceptable too. There is no predetermined number of activities which should be completed and no child is forced to interact with a particular activity.

After the time for "doing" has been completed (usually about 25 minutes), the children return to the circle group time to share ("review") what they did in centers. The teacher often helps this process by asking "Johnny, what did you play with in centers today?" When a child has a hard time remembering, or is quiet and unsure of reviewing at first, the teacher can help by suggesting, "Did you play with the magnets today? What happened when you used the magnet?" The teacher is able to ask Johnny about his "plan" because she floated through the centers and observed what each child did. (Reviewing takes about 5 minutes.) After each child has had a chance to review, the concept for the session is reemphasized or recapped by the teacher, and the session is ended.

Activities

The activities which are included in **Developing an Early Interest in Science** are all hands-on, manipulative activities. Every effort is made to make the concept for each session real and meaningful for children by allowing them to experience it. For example, rather than just talk about the fact that water flows because it is a liquid, the children actually pour water through clear tubes and watch the flow in action. Rather than talk about internal body parts children can't see, special dolls are used which allow children to uncover those hidden inside body organs such as hearts and lungs. Whenever appropriate books and puppets are used to enhance language. Science develops wonderful vocabulary! Puzzles are used to help children develop fine motor skills and explore science.

Real materials are used whenever possible. Real butterfly displays are explored rather than exclusively using colored pictures of butterflies. Real rocks of a wide variety are provided. Both real and replica fossils are manipulated. There is much to be said for allowing children to experience the "real thing." Yes, some science materials are fragile, but children will never learn to be careful unless there is reason to be so. Imagine touching and feeling a real fossil from a dinosaur! It takes little enticement to be gentle with a thing so old, if children are only reminded just how precious fossils are.

Resource Activities

Developing an Early Interest in Science has also been designed to include resource or enrichment activities to further extend the concepts from each session. Some resource

activities suggest the use of real objects easily obtainable. Many other resource activities are made with patterns to produce manipulative games with which to review session concepts. Masters of the patterns and directions for their use are included with the curriculum. A brief listing of the resource activities made from the patterns along with additional suggested activities can be found in the session descriptions. More detailed directions for assembly of patterns to make the resource activities can be found in the teacher resource activity section. Lists of suggested books, fingerplays, and songs to be used by the classroom teacher in order to infuse the science concepts throughout the child's day are also included in a separate section of the curriculum.

Using **Developing an Early Interest in Science**

Whatever format meets your particular needs, it is important that you read the session through before trying it. As you read the session procedure, try to picture how and where you will lay out the center activities. Review the storybooks suggested and read them before the sessions. Practice the fingerplays before the session too. Anticipate the questions children will ask. Perhaps most important, get excited about what you will be sharing with the children! Your enthusiasm is contagious!

A suggested list of materials used in the centers is included with each unit. From time to time, materials are discontinued by manufacturers. If this should happen before you can access the materials suggested, review the session to determine how that particular material was used and select a substitute item. While the materials suggested worked well, there's nothing to say that a substitute item might not do just as well or even better.

Most important in using **Developing an Early Interest in Science** is to encourage children to play, interact, and enjoy. An early interest in science cannot be developed if children are chastised for messes and trying something that wasn't the adult intention. Science requires hypotheses and tests for hypotheses. Children are natural "little scientists" if allowed to explore. So relax and watch those little scientists blossom!

Earth Science

Session Activities

Four-Year-Olds

EARTH SCIENCE

Four-Year-Olds

Session 1

CONCEPT: Air takes up space. (Children will become familiar with the concept that air does take up space even if it cannot be felt or seen.)

PROCEDURES:

1. Gather the children in a circle group. Open with a name fingerplay to distribute name tags/review names. Introduce the concept with a fingerplay about air.

2. Open by reviewing the concept from the previous year that air moved things. Tell the children that today you are going to talk about how we can tell air is there even when we can't see it.

3. Tape a black and white picture onto the bottom of a large clear shoe box and fill with colored water. Demonstrate how you can push a large, clear cup, open end down, into the water, but that if you let go, the cup pops up. Give children a chance to see how the picture taped on the bottom appears to be colored except where the cup goes down into the water. Let the children feel how the inside of the cup isn't even wet. Why? Let some of the children try to push the cup down into the water too. Why is it so hard to push? Air. Introduce the idea that the cup really isn't empty- it's full of air. Prove it by pushing the cup back into the water and then tilting it.-where did the bubbles come from? The bubbles are the air racing out of the cup as the water races in.

4. Let's show another way air takes up space. Give each child an empty plastic bag. Talk about the bag at present - why is it flat? How can we capture some air? Show the children how they can swing the bag through the air and quickly close it shut. How can you tell there is air in the bag? (The bag is "full.") Open the bag. Where did the air go? Try it again. Review that just by pulling the bag through the air, the bag catches some of the air so we can "see" it.

5. Read Air, Air Everywhere. Ask the children to watch for all the different places that air is.

6. Do a fingerplay to resettle the group and prepare to disperse to centers. Once attention is regained, explain the center options available for that day. After you have explained the centers, ask the children to choose where they would like to go. As they choose, send them on their way. Allow the children to freely play and choose another center as they finish each task. Be sure to float from center to center and interact with the children as they play to reinforce the concepts for the day. The center options today are:

A. Provide a cup in a large shoe box full of water. Let children try to put the cup in the water upside down. Remind children what is in the cup. Help them make the air escape and make bubbles. Allow 2 children in this center.

B. Provide a hand pump to inflate a playground ball. Allow the children turns to pump up the ball. Let children feel air coming out of the pump. How can they tell that the air is taking up space? Allow 2 children at this center.

C. Provide plastic bags in a center so that children can again try to catch the air in their bags and then let it go. Since children are playing with plastic bags, supervision by adults with this activity is important. Allow 4 children at this center.

D. Provide hand pumps for the children to put air into inflatable toys. Remind them why the toy gets bigger. Allow 4 children at this center.

E. Provide foot pumps for the children to put air into inflatable toys. Remind them why the toy gets bigger. Allow 4 children at this center.

7. Two minutes before you are ready for the children to clean up, turn out the lights and make an announcement to warn them to begin finishing up whatever they are working on. After two minutes, turn out lights again and ask the children to clean up. Call children back to the group circle with a song. Allow each child to share one thing they learned or played with during center time. Review centers by graphing deflated and inflated items on a large plastic bar graph.

8. Sing a good-bye song and collect name tags from children.

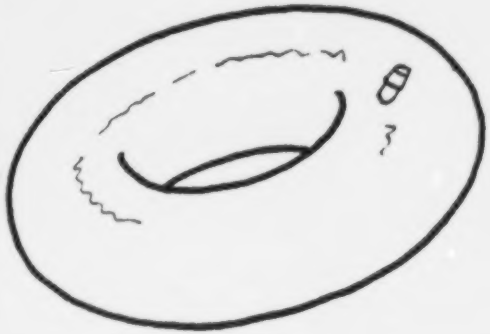
Resource Kit

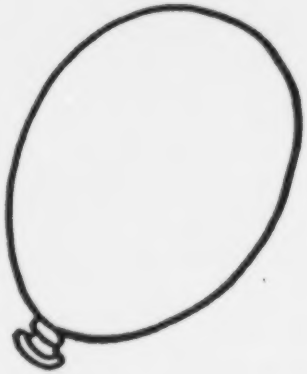
1. Use the patterns to make a lotto game to match pictures of deflated and inflated items.

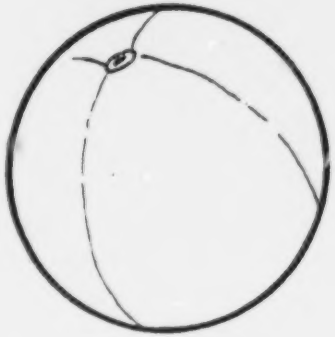
2. Use the patterns to make a sequence story showing inflating the inner tube.

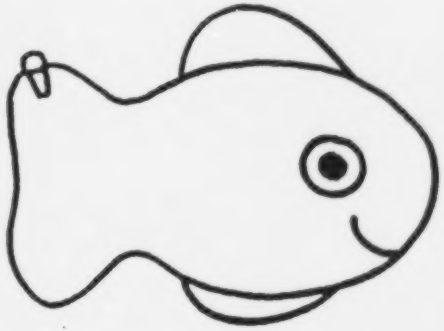
3. Provide several beach balls.

4. Leave behind the playground ball that is inflated during teaching session.









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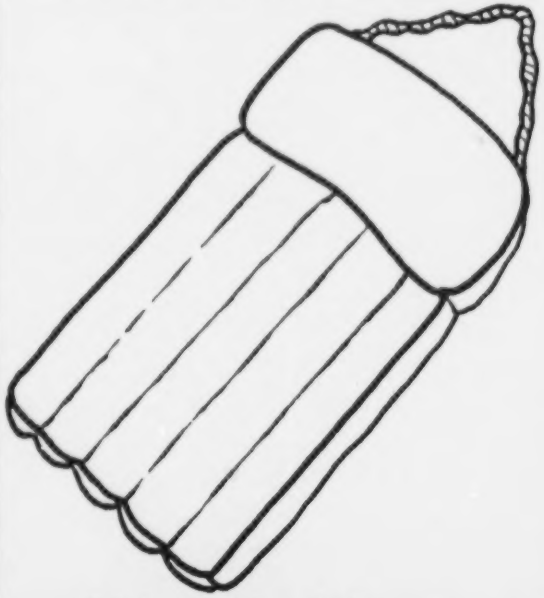

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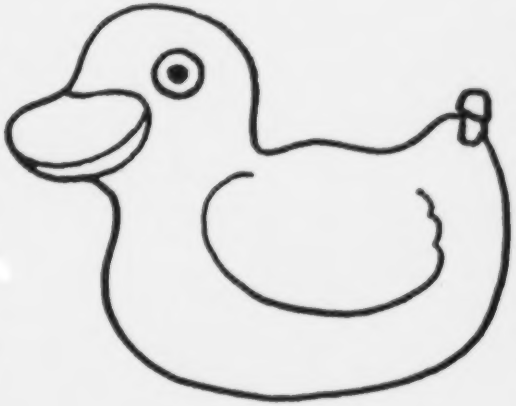

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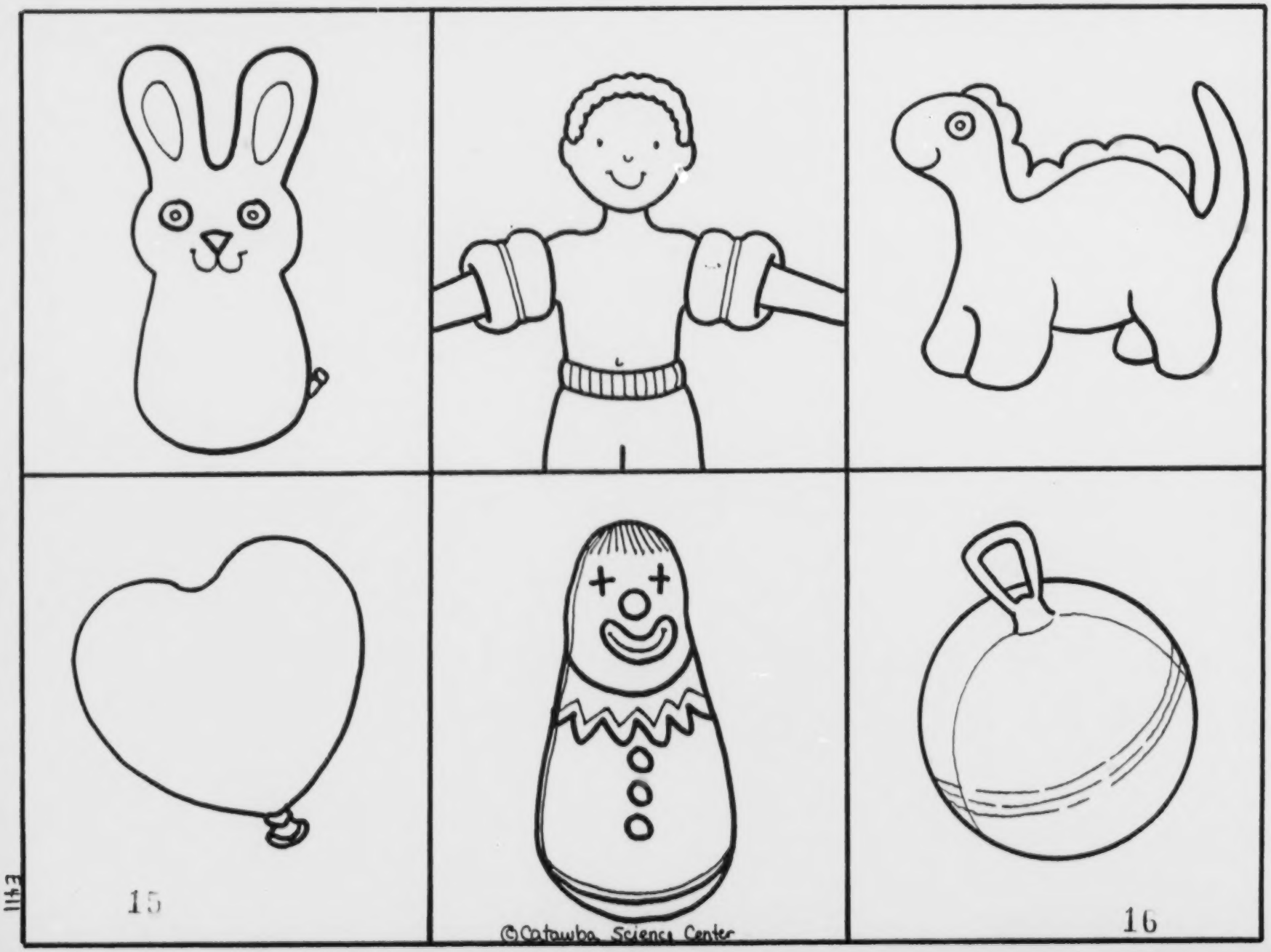
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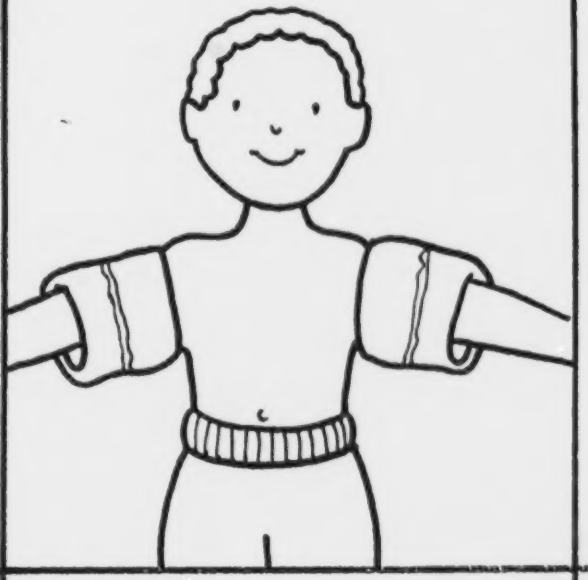

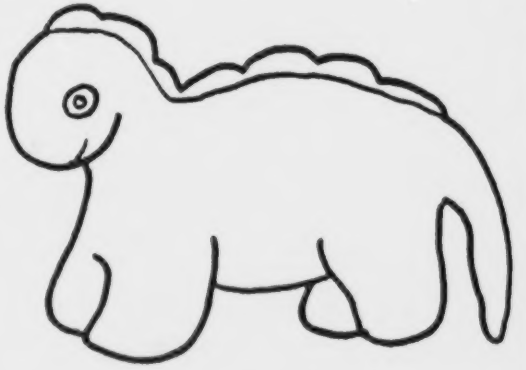

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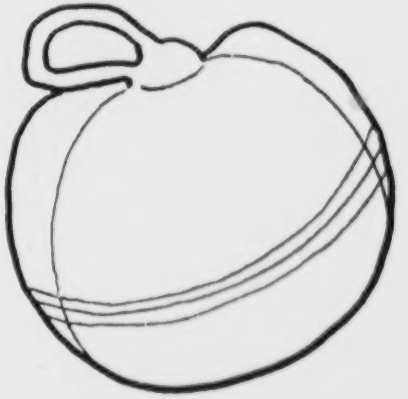

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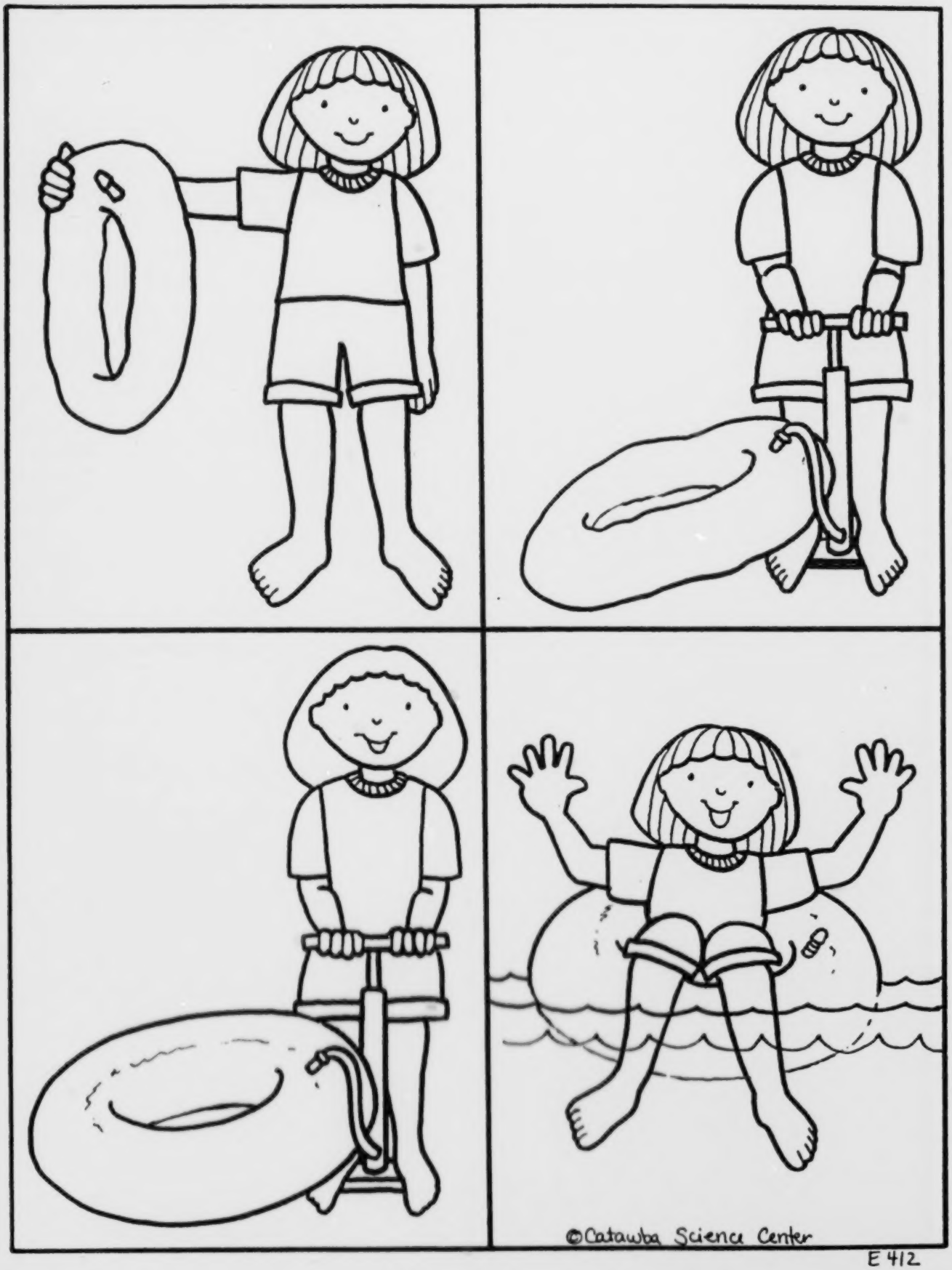
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EARTH SCIENCE

Four-Year-Olds

Session 2

CONCEPT: Water has special characteristics. (The children will become familiar with absorption, evaporation, and dissolving.)

PROCEDURES:

1. Gather the children in a circle group. Open with a name fingerplay to distribute name tags/review names. Introduce the concept with a fingerplay.

2. Introduce the water cycle concept by reading Water, Water Everywhere. Ask the children what happened to the lake in the story. (It froze, melted, evaporated, filled again.) Focus on evaporation. How did the water disappear? What happens when you hang wet clothes outside? Leave a pan of water out in the classroom with a record page. Tell children they need to write about what happens to the water.

3. Next, talk about how water does more than just evaporate. Place some colored sugar in a clear glass. Pour in water. What happens to the sugar? Water makes certain substances dissolve. When something dissolves it mixes completely with the water.

4. Certain things also absorb water. What happens when you spill water? Why do we get paper towels to clean it up? What happens when you place the paper towel in the water? We call that absorption. Certain things soak up, or absorb, water.

5. Read Water, Water All Around Us to calm the group before centers.

6. Tell the children that in centers today they will be able to experiment with absorption and dissolution. After you have explained the centers, ask the children to choose where they would like to go. As they choose, send them on their way. Allow the children to freely play and choose another center as they finish each task. Be sure to float from center to center and interact with the children as they play to reinforce the concepts for the day. The center options today are:

A. Provide a variety of substances (flour, salt, sugar, iced tea mix, oregano, sand, chocolate drink mix, tang, detergent, baby powder, baking soda), small cups filled with water, 4-6 small paint pallets or mini muffin tins, 4-6 popsicle sticks, and several large medicine droppers. Help children spoon a small amount of several of the substances into each section of the paint pallet. Let the children drop a few drops of water from the cups onto the substances with a medicine dropper and stir gently with the popsicle stick. Talk about which substances dissolve and don't dissolve. Allow 4-6 children at this center--one child per paint pallet.)

B. Provide a variety of objects that absorb and do not absorb water (T-shirts, sponges, cotton gloves, foil, rocks, clear piece of vinyl, paper towels, washcloths). Provide small cups of water and large medicine droppers. Let the children drop a medicine dropper full of water from the cups onto the objects to check for absorption. Talk about which objects absorbed and which didn't. Allow 4 children at this center.

C. Provide chalk and white paper and let children draw. Then, give children a spray bottle filled with water and let them spray their pictures. Talk to children about what happens when water hits the chalk. Remind children that water dissolves. Allow 4 children at this center.

D. Provide sponges, T-shirts, socks, washcloths, paper towels, and a weighing balance. Let children weigh each item dry and then wet. Talk about which is heavier. Allow 2 children at this center.

E. Provide coffee filters and diluted food coloring. Show children how to fold the filters and dip into the food coloring. Open the coffee filters to see how the color was absorbed. This activity will allow children to experiment with absorption. Allow 3-4 children at this center.

F. Provide Kool Aid, cups, measuring spoons, and a pitcher of water. Let children make their own drink by measuring out the appropriate amount of Kool Aid, placing the granules in the cup, and filling with water to dissolve the Kool Aid. (You will need to experiment with the size cup you provide and the Kool Aid to discover which size measuring spoon to provide in this center.) Allow 2 children at this center.

G. Provide books about water in a center. Read to the children at their request. Allow 2 children at this center.

7. Two minutes before you are ready for the children to clean up, turn out the lights and make an announcement to warn them to begin finishing up whatever they are working on. After two minutes, turn out lights again and ask the children to clean up. Call children back to the group circle with a song. Allow each child to share one thing they learned or played with during center time. Review the concepts learned that day.

8. Sing a good-bye song and collect name tags.

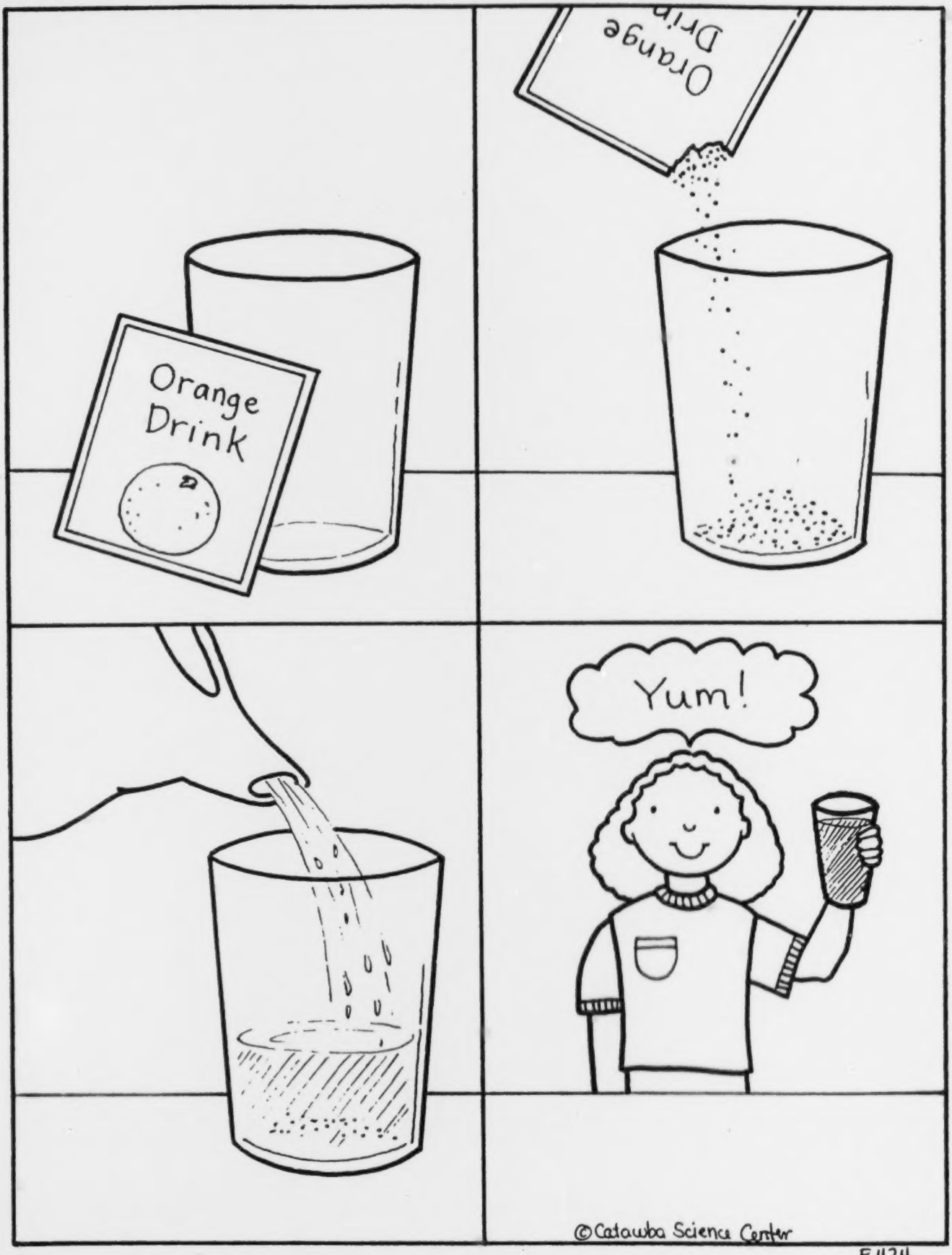
Resource Kit

1. Leave behind several large medicine droppers for continued exploration.

2. Provide a set of ABC (or other shaped) sponges for continued exploration.

3. Provide several expanding capsule creatures. (These small capsules, when placed in water, dissolve to expose a sponge inside which expands as it absorbs water.)

4. Use the patterns to make several sequence stories showing absorption(sponge, shirt), evaporation(puddle, shirt), and dissolution(drink mix).


Orange Drink
Orange Drink
Yum!
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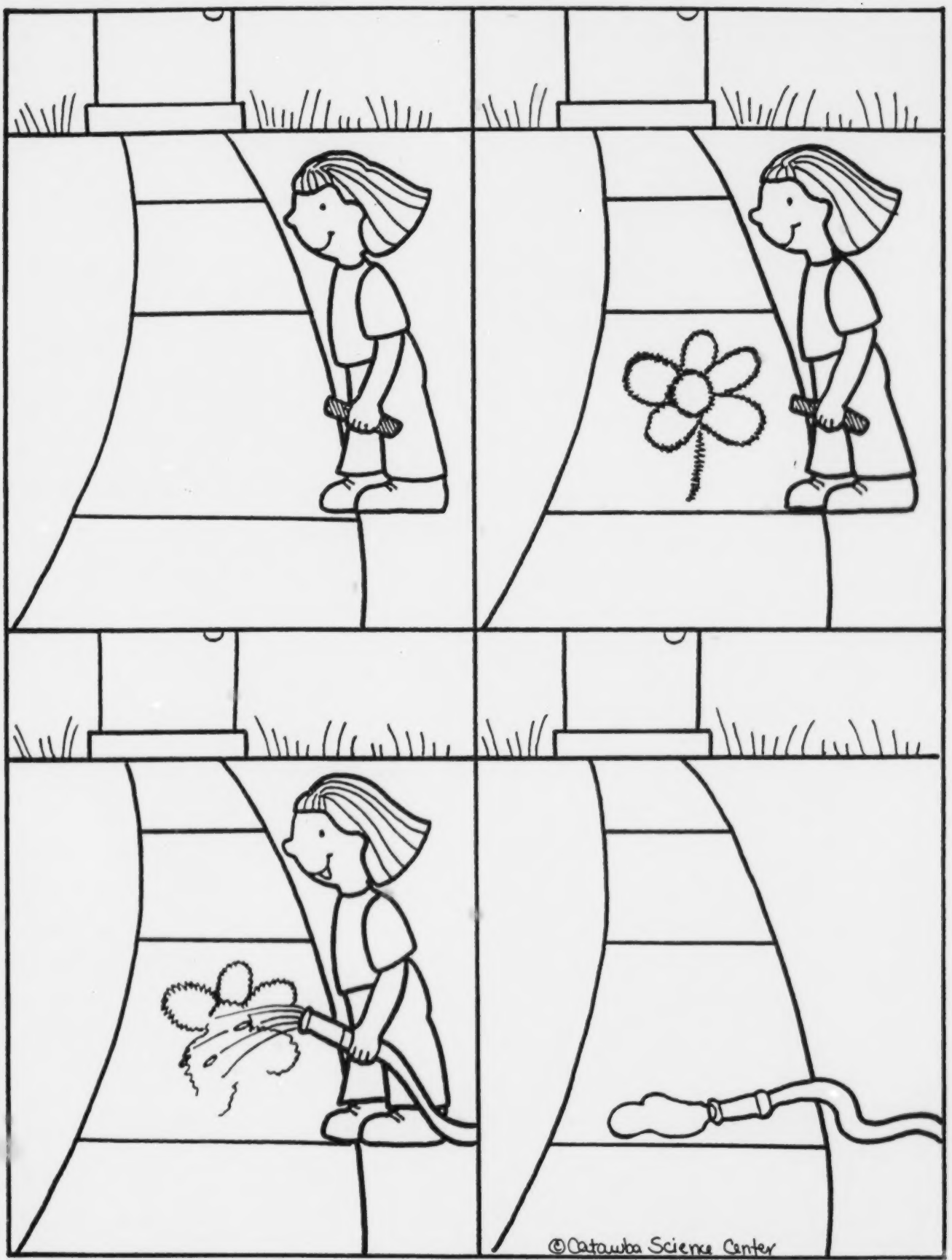

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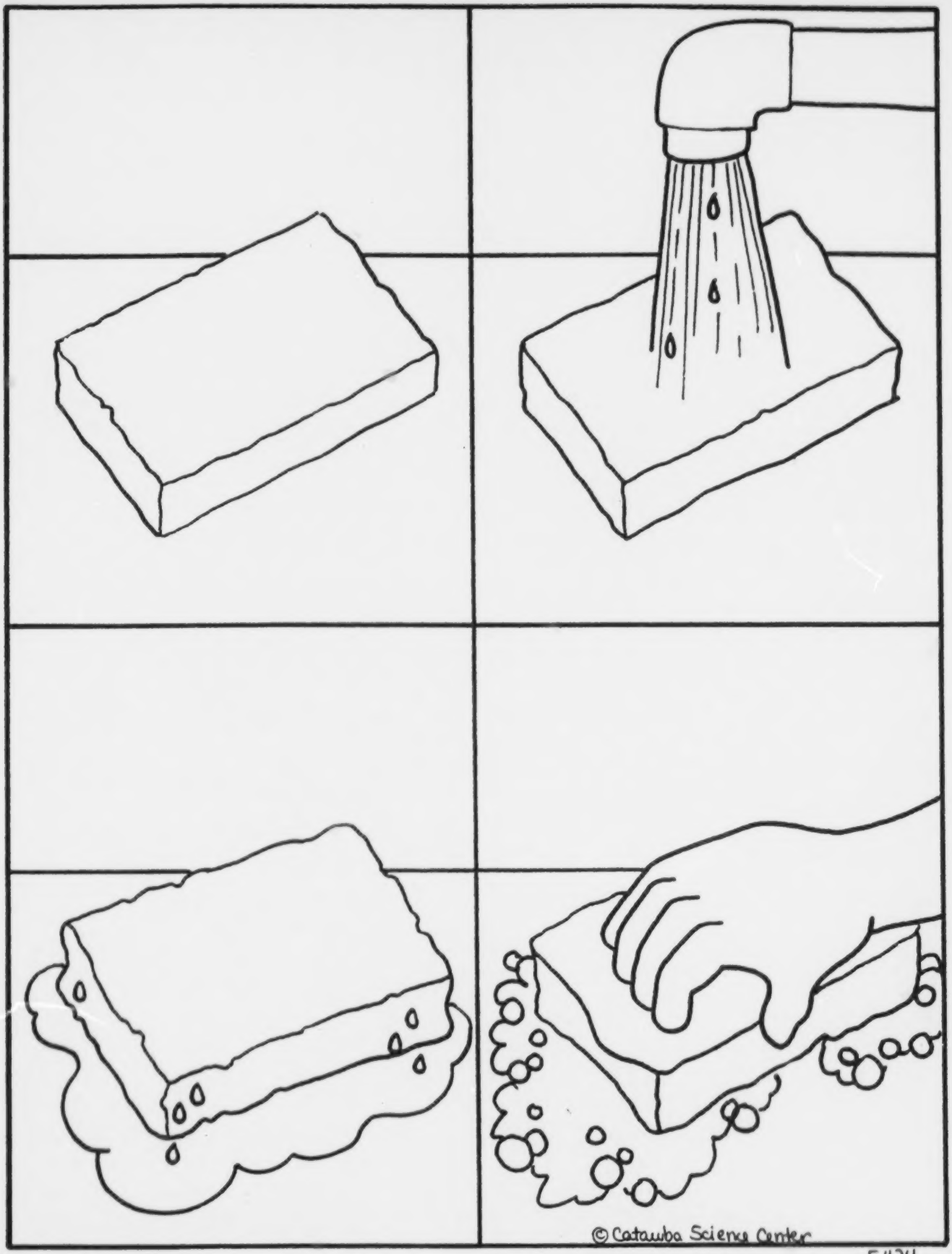

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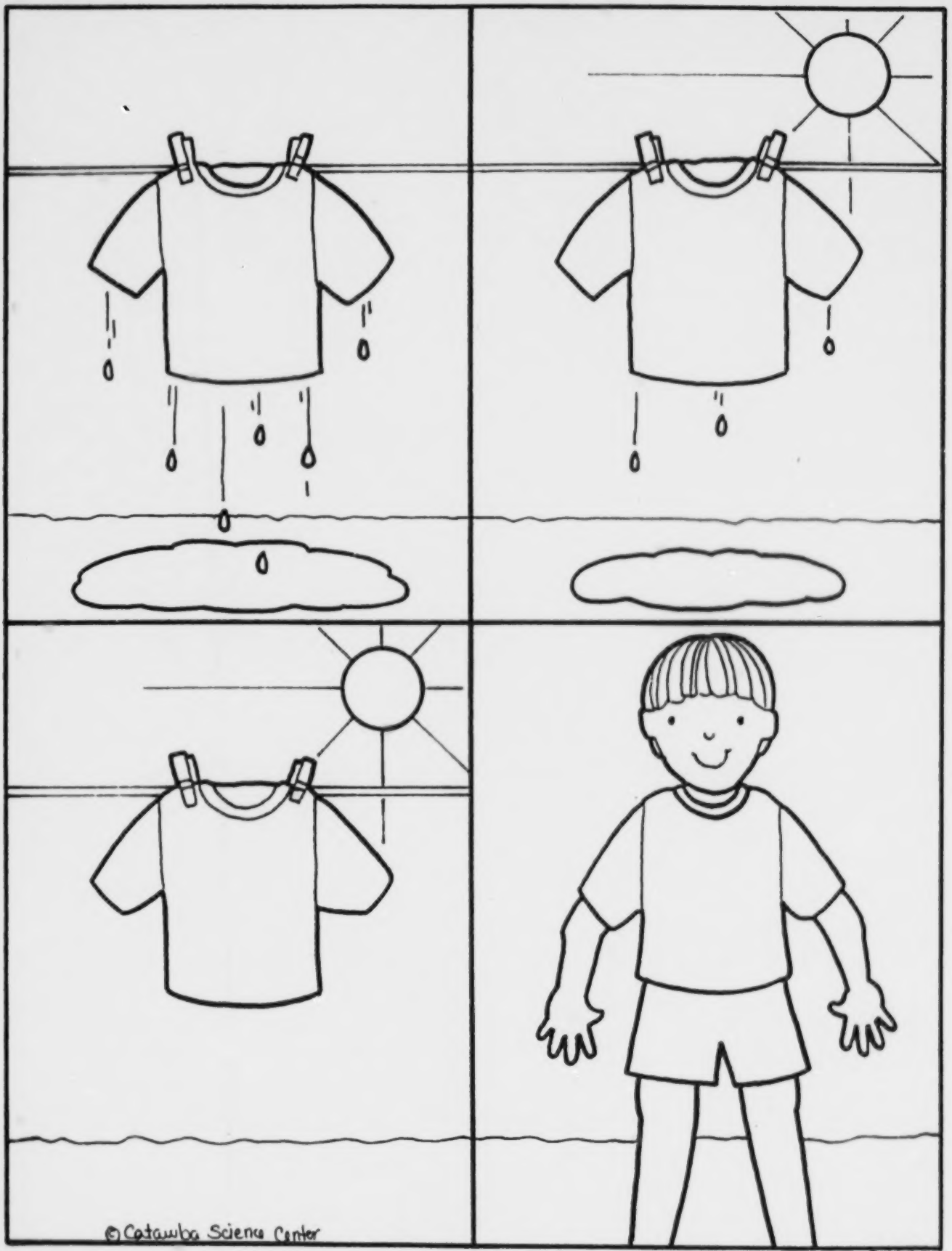
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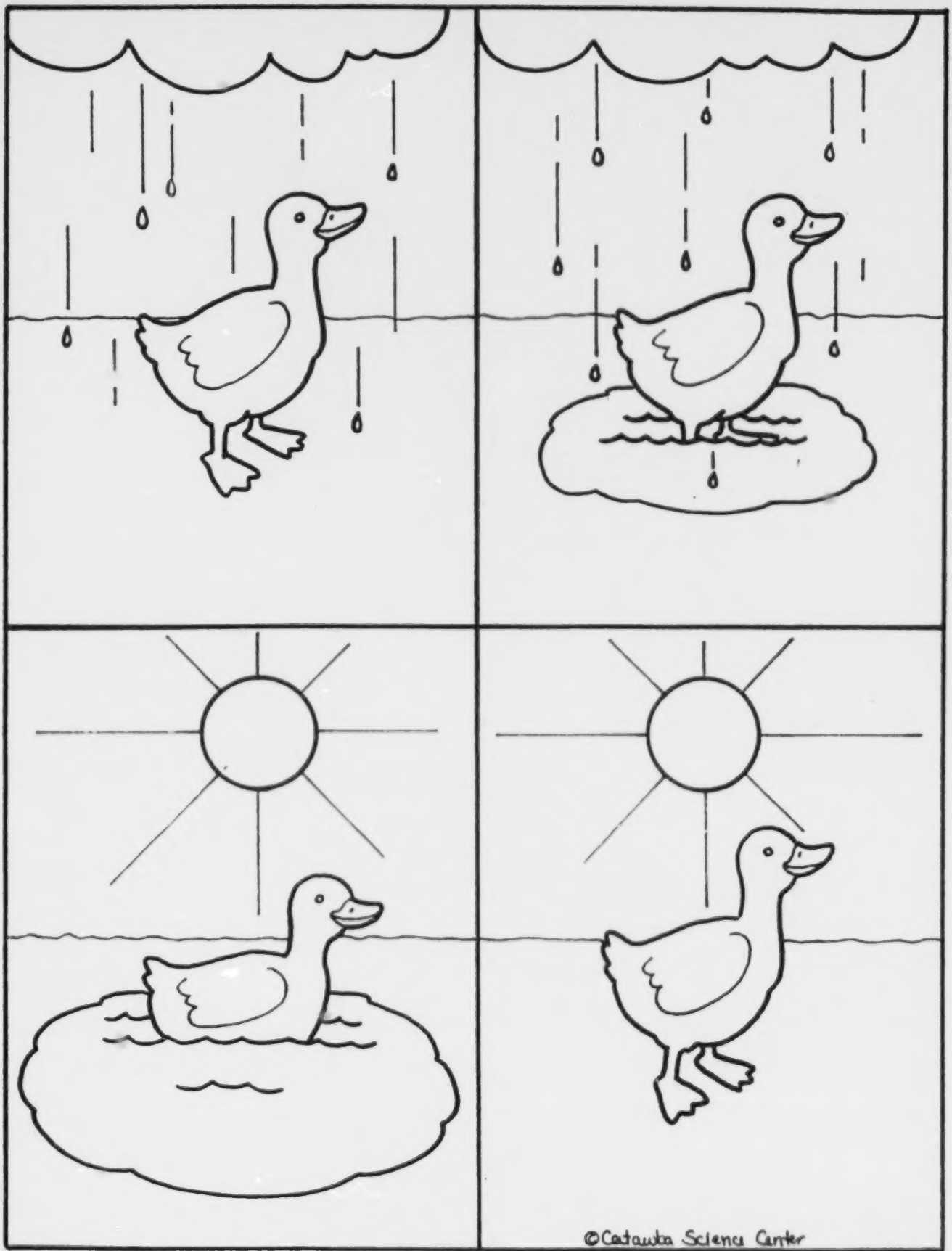

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EARTH SCIENCE

Four-Year-Olds

Session 3

CONCEPT: Some rocks are fossils. (The children will become familiar with the idea that some rocks have actual pieces of animals/plants in them from long ago.)

PROCEDURES:

1. Gather the children in a circle group. Open with a name fingerplay to distribute name tags/review names. Introduce the concept of fossils with a fingerplay.

2. Distribute a fossil to each child and let them examine it carefully. Call attention to the fossil and talk about how the fossil is a special rock. Read the book *Dinosaur Bones* by Aliki about dinosaurs and fossils. Talk about how the only way we know about the dinosaurs is from fossils scientists have found. Scientists piece the dinosaur together like a puzzle. Show the complete fossil replicas of smaller animals. Show/discuss the pictures in the book *Dinosaur Bones*.

3. Tell the children they will get to be paleontologists today in centers as they explore and hunt for fossils. Once attention is regained, explain the center options available for that day. After you have explained the centers, ask the children to choose where they would like to go. As they choose send them on their way. Allow the children to freely play and choose another center as they finish each task. Be sure to float from center to center and interact with the children as they play to reinforce the concepts for the day. The center options today are:

A. Bury plastic fossils in large clumps of playdough. Let the children shave away the playdough with a plastic knife and find the plastic fossils that were hidden inside. Let children match the fossils. Allow 4-6 children at this center.

B. Provide a variety of fossils used in group time in a center and let the children examine them with magnifiers. Allow 4 children at this center.

C. Provide the counting dinosaurs in a center and let children sort by type of dinosaur and by color of dinosaur. Allow 4 children at this center.

D. Provide the dinosaur puzzles in a center. Ask the children questions about dinosaurs as they work the puzzles. Allow 6-8 children at this center.

E. Provide plastic fossils and clay (NOTE: playdough cracks when it dries, and plasticene doesn't dry out, so use real clay for this activity.) and paper plates. The children make their own fossil by placing a small clump of clay on the paper plate and then pressing

a fossil into the clay to make an impression. Allow the clay to dry on the plate. Allow 4-6 children at this center.

F. Provide two identical sets of fossils for children to match. Allow 2-3 children at this center.

G. Provide fossils which show a complete animal or plant to make crayon rubbings using white paper and crayons. The children lay the paper over the fossil and rub with a crayon. Allow 2-3 children at this center.

H. Provide dinosaur tracers and paper in a center for children to make dinosaur tracings and rubbings. Allow 2-3 children at this center.

J. Provide real or plastic fossils hidden in a large tub of navy beans. Provide sifters and scoops and allow the children to dig for the fossils. Encourage children to match those that are the same. Allow 2 children at this center.

4. Two minutes before you are ready for the children to clean up, turn out the lights and make an announcement to warn them to begin finishing up whatever they are working on. After two minutes, turn out lights again and ask the children to clean up. Call children back to the group circle with a song. Allow each child to share one thing they learned or played with during center time. Review the concepts learned that day.

5. Sing a good-bye song and collect name tags.

Resource Kit

1. Use the patterns to make a lotto game to match the animal to its fossil.

2. Use the patterns to make cards to be used with the dinosaur counters as attribute guides in sorting.

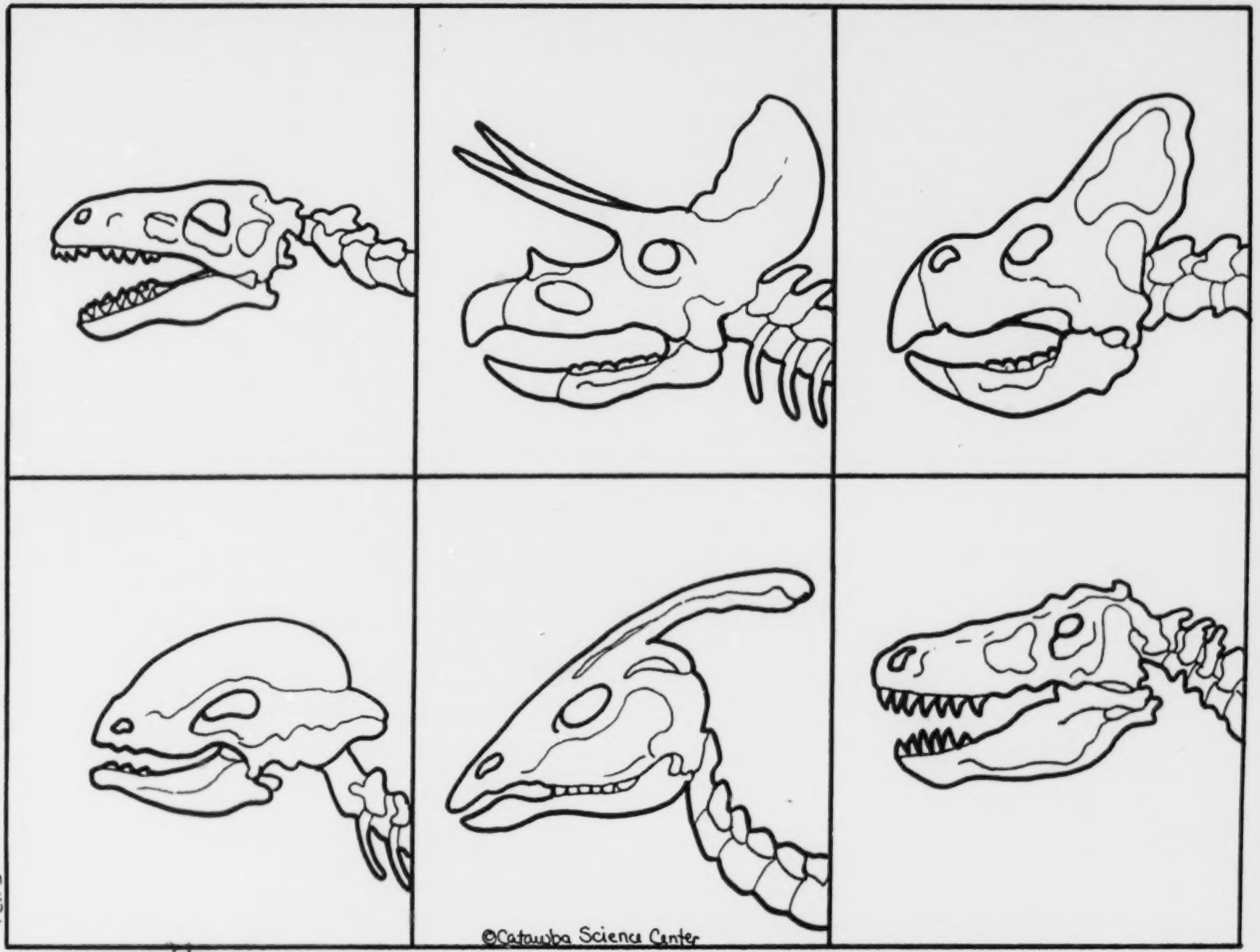
3. Provide one set of plastic fossils for continued exploration.

4. Suggest that the classroom teacher make or provide dinosaur tracers/stencils to be used in the art center.

5. Use the patterns as a story starter "If I were a Paleontologist..." to write a class book.

6. Use the patterns to make a sequence story of a fossil dig.

7. Use the patterns to make the book *Fossils Tell A Story* to put together into class storybook.



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E431

31

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Dromaeosaurus

Triceratops

Protoceratops

Pachycephalosaur

Parasaurolophus

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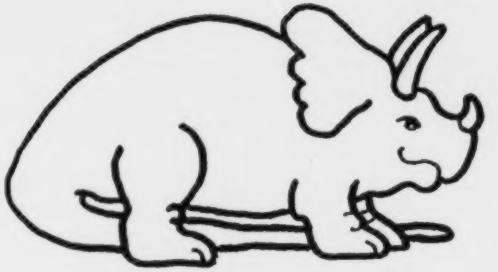
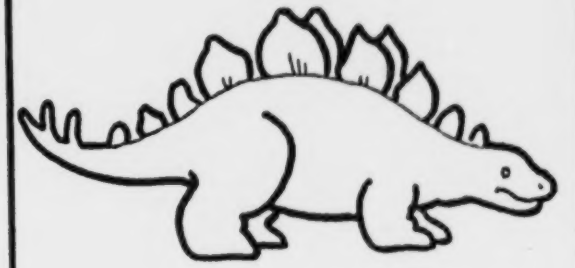
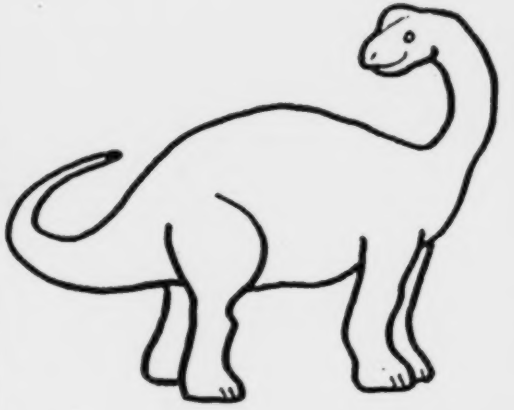
Tyrannosaurus

E431







E432

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If I were a palentologist
I would like to find . . . . . .

E 435

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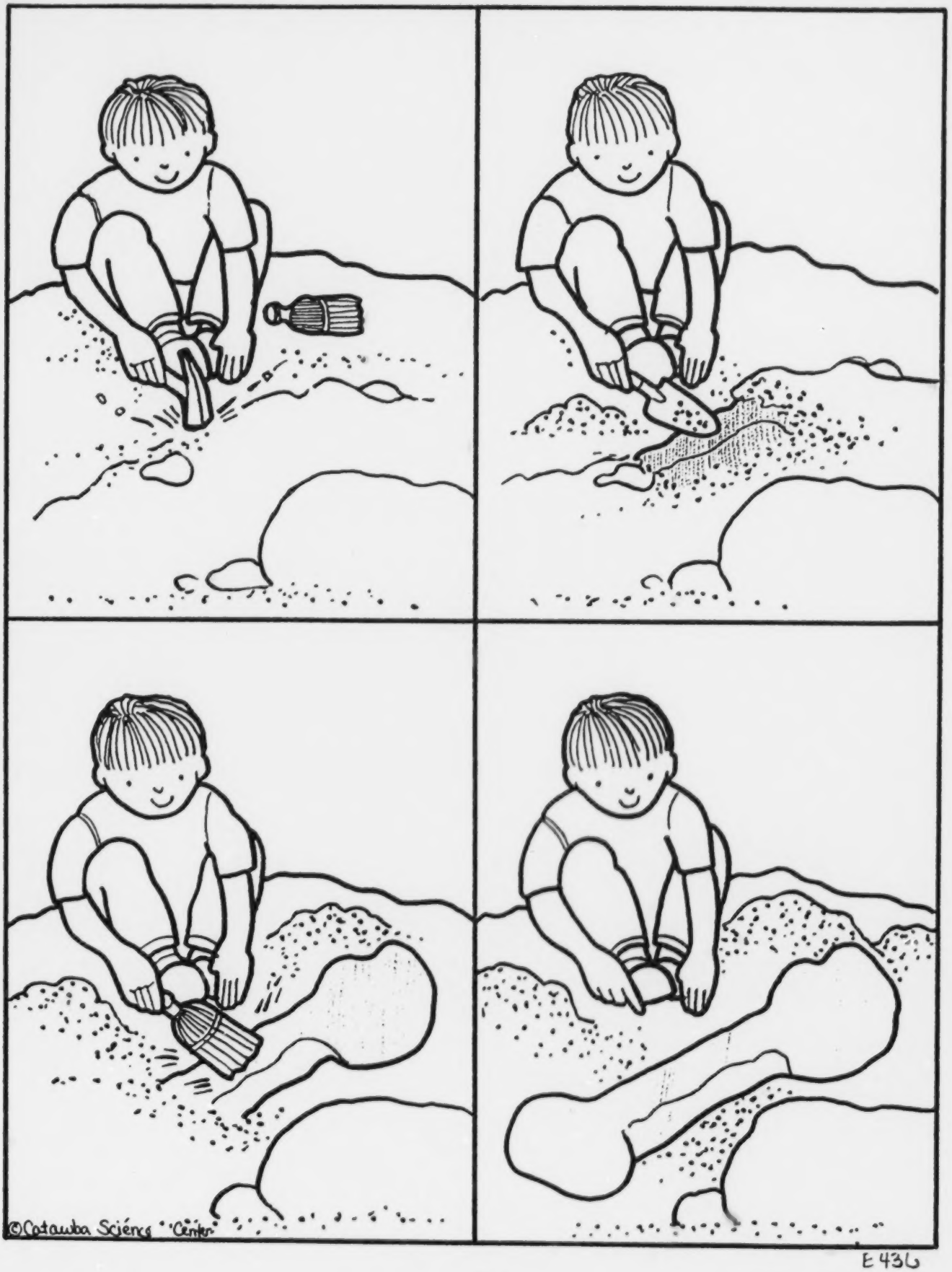

E436

Fossils Tell A Story

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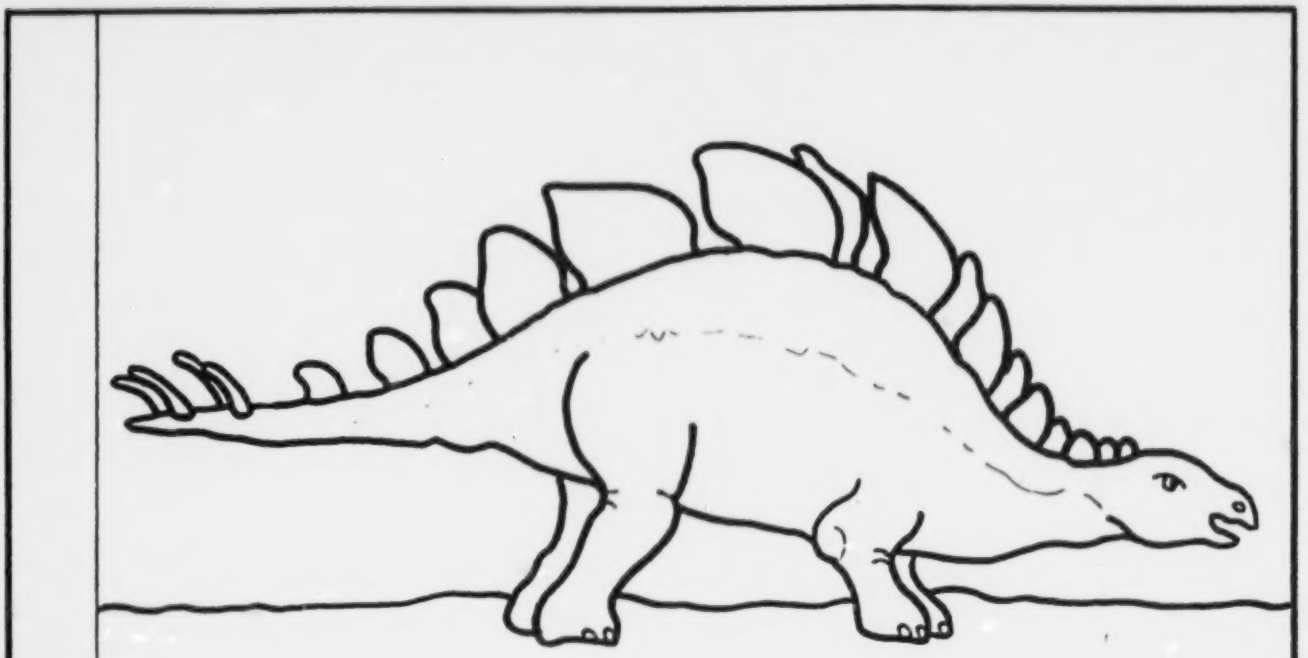

Dinosaurs lived long ago.

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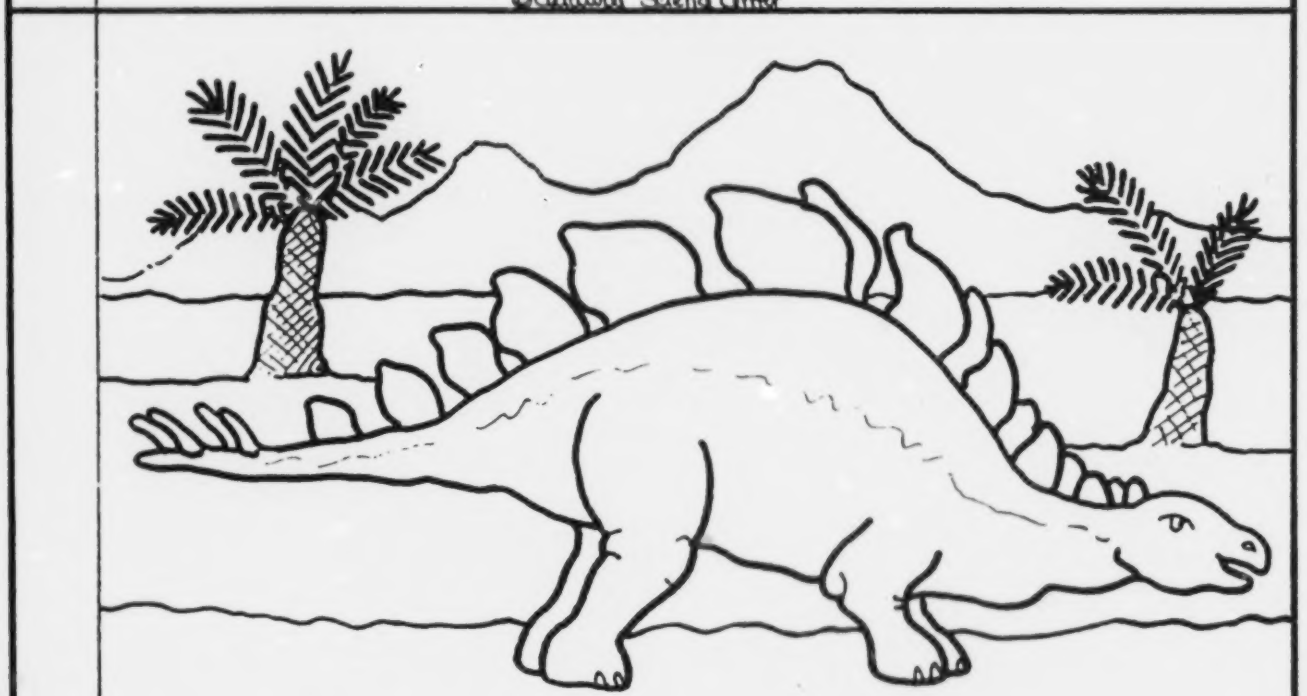
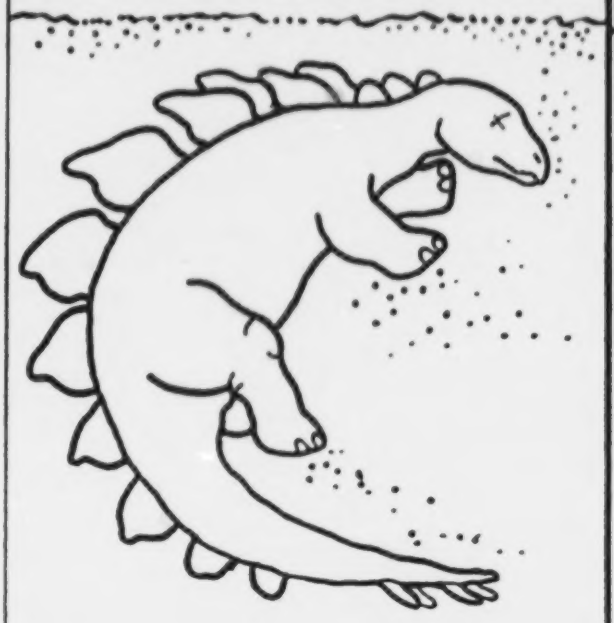
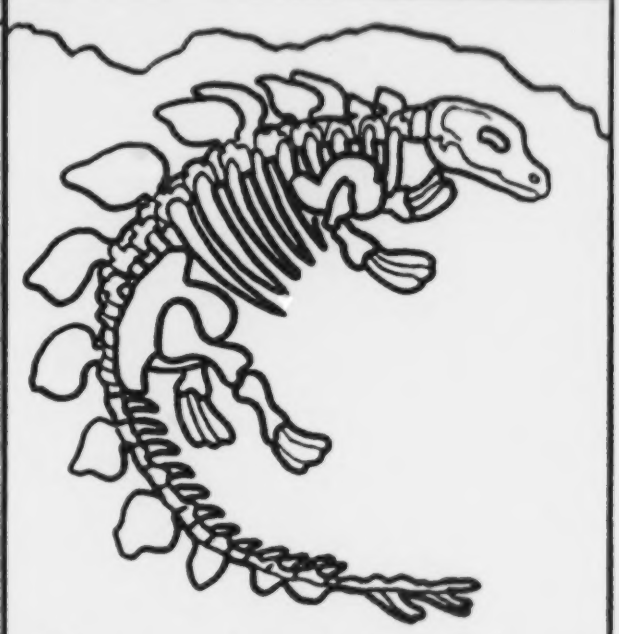


People did not live
when dinosaurs lived.

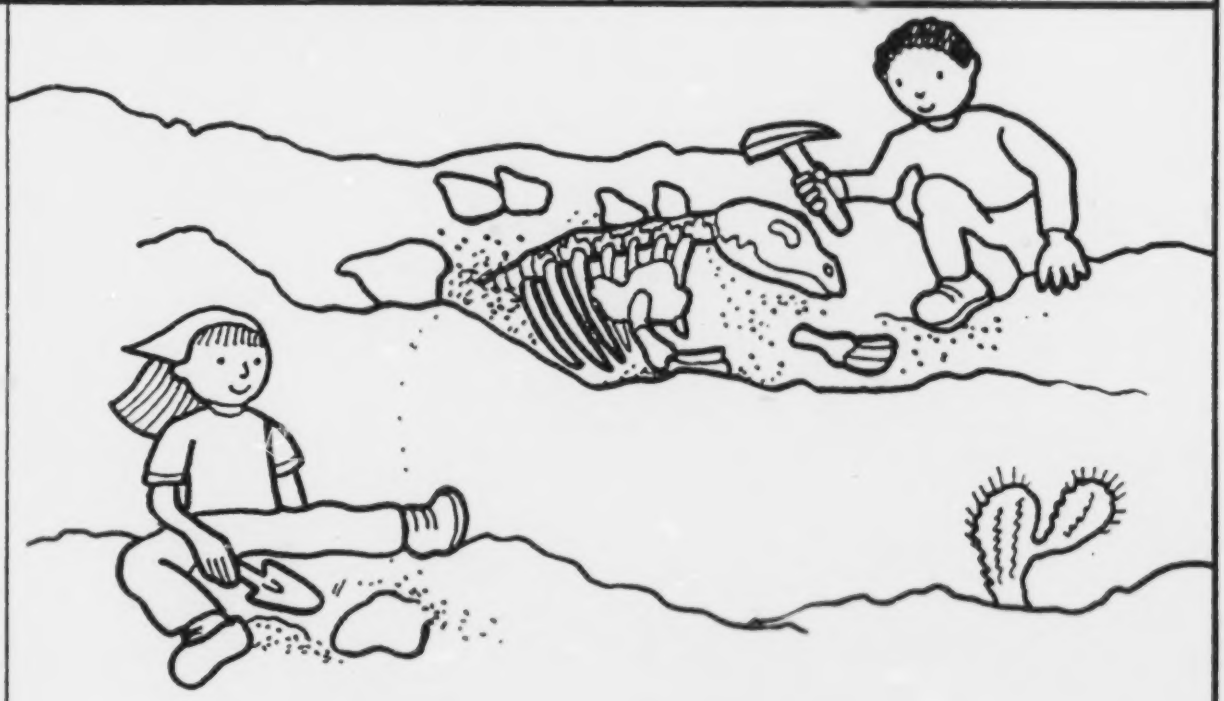
E 437



When some dinosaurs died, their bones lay in mud or in sand.



After a long time, their bones became special rocks called fossils.



Today, people dig for the fossil bones.

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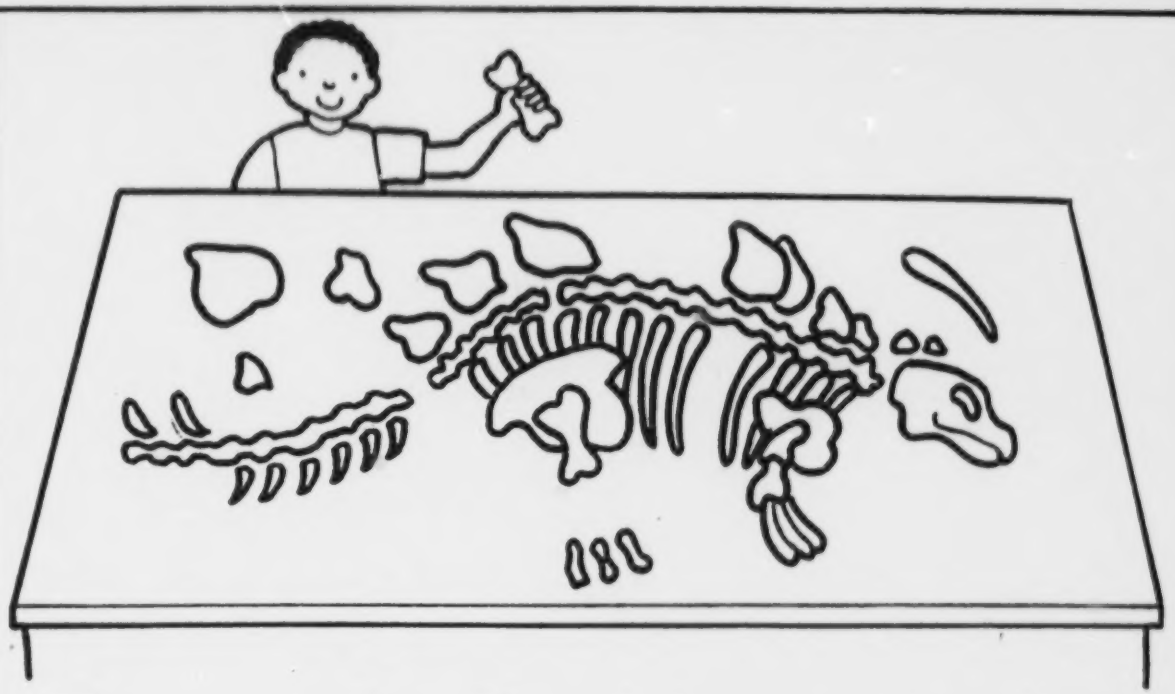
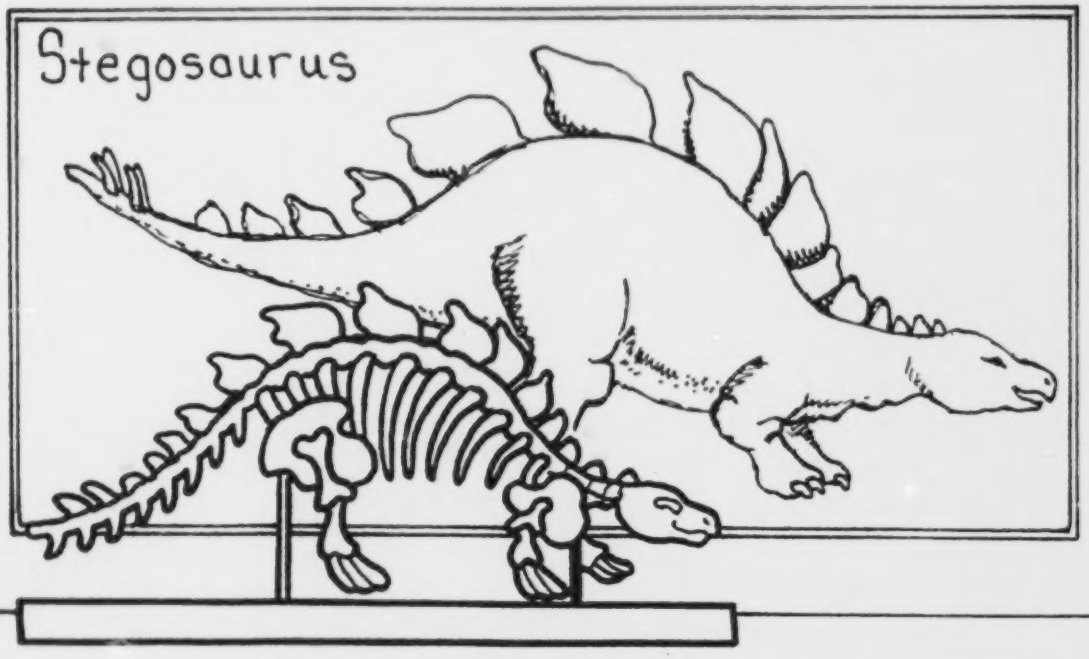
E 43/



They put the fossil bones together like a puzzle.



That's how we know what dinosaurs might look like.

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E 437

EARTH SCIENCE

Four-Year-Olds

Session 4

CONCEPT: It is important to keep our natural resources clean. (The children will learn ways they can keep our water, land, and air clean and why it is important to do so.)

PROCEDURES:

1. Gather the children in a circle group. Open with a name fingerplay to distribute name tags/review names. Begin session by reviewing three previous sessions about air, water, and fossils (land). Tie in today's session by introducing the idea that air, water, and land are resources which we need, but we need to take care of them if we want to have them for a long time.

2. Show a poster showing polluted water. Ask the children what they think happens when water becomes polluted. Introduce the book My River and ask the children to listen to what the fish has to say about keeping the river he lives in clean for him. After reading, allow the children to share what they learned about the river and the fish.

3. Fish live in water, so it's important to keep the water clean. But it's also important to take care of our land and forests. Introduce the iguana puppet. Tell how the puppet lives in a special place called the rain forest. On a globe, show your home state and then where the rain forests are. Let the puppet tell how some people are cutting down the rain forest for the lumber, and ask the children whose homes are being cut down too. Let the puppet tell that it takes a very long time for the trees to grow again and that many animals depend upon the rain forest. If all the trees are gone, these animals have no place to live.

4. Introduce the toucan puppet and ask the children where he likes to fly. Review that we need to keep water and land clean, but that some animals need clean air too. Review how we use our lungs to breathe and how we therefore need clean air, too.

5. Do a fingerplay with a conservation theme to wrap up circle and resettle the group. Once attention is regained, explain the center options available for that day. After you have explained the centers, ask the children to choose where they would like to go. As they choose, send them on their way. Allow the children to freely play and choose another center as they finish each task. Be sure to float from center to center and interact with the children as they play to reinforce the concepts for the day. The center options today are:

A. Provide mini motor (transportation) counters for children to sort by where they run : on land, on sea, or in air. Allow 3-4 children at this center.

B. Provide the ocean environment background and play ocean creatures to play with. Talk about the different creatures and why they need a clean ocean to live. Allow 4 children at this center.

C. Provide the large floor puzzles of the rain forest and mountain life in a center. Discuss the animals in the puzzles and why they need clean air, water, and land. Allow 4-6 children at this center.

D. Provide an assortment of books about the rain forest and conservation in this center. Encourage children to find pictures of the different animals and plants you had discussed earlier. Read to the children at their request. Allow 3-4 children at this center.

E. Provide a variety of animal finger puppets for the children to pretend play as they talk about how animals need air, land, and water to live. Allow 6 children at this center.

F. Provide rain forest animal counters for the children to match and sort. Allow 4 children at this center.

G. Provide the rain forest sponges, paint, and paper in a center and let the children sponge paint. Allow 2 children at this center.

H Provide the Nature Lotto game in a center and let children play the game with an adult. Help them match the pictures to the animals on the cards. Ask children whether they think the animals live on land, in water, or in the air. Allow 4 children at this center.

I. Provide habitat backgrounds depicting forest, ocean, meadow, mountains and a variety of animals. Let children sort by where the animals live. Allow 2 children at this center.

J. Provide the large iguana and toucan puppets for the children to play with. Allow 2 children at this center.

6. Two minutes before you are ready for the children to clean up, turn out the lights and make an announcement to warn them to begin finishing up whatever they are working on. After two minutes, turn out lights again and ask the children to clean up. Call children back to the group circle with a song. Allow each child to share one thing they learned or played with during center time. Read <u>At Home in the Rainforest</u> to review the day's concept.

7. Sing a good-bye song and collect name tags.

Resource Kit

1. Provide plastic land and sea animal counters for sorting.

2. Use the patterns to make a class book about rain forest animals.

3. Use the patterns to make a class book about conservation.

4. Use the patterns to make a set of rain forest animal dominoes.

5. Use the patterns to make a story starter "I can conserve by..." to make a class book.

6. Use the patterns to make a lotto game to match rain forest animals.

7. Use the patterns to make a sorting game of transportation vehicles.

8. Use the patterns to make a game to sort animals that live on land, air, and water.

9. Use the patterns to make several lotto games to match air transportation, water transportation, and land transportation.

Rain Forest Animals

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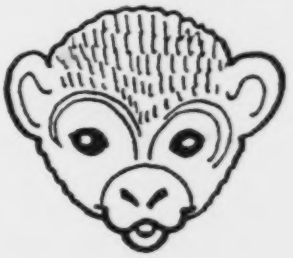
The End



E442

monkey

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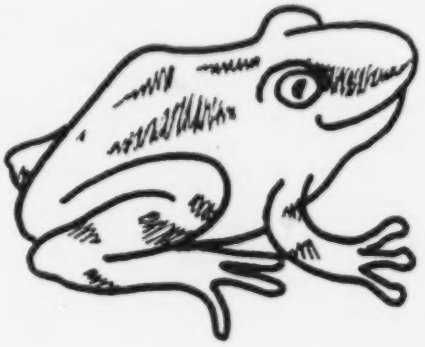
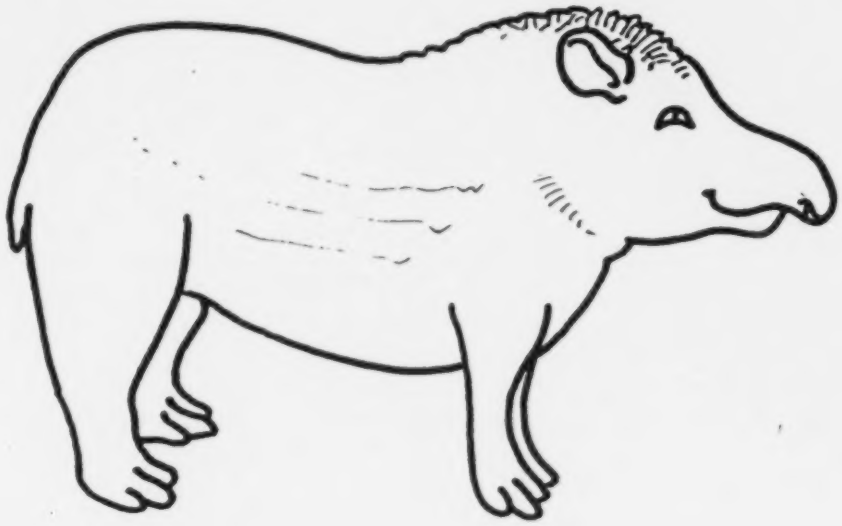
frog



E 442

tapir



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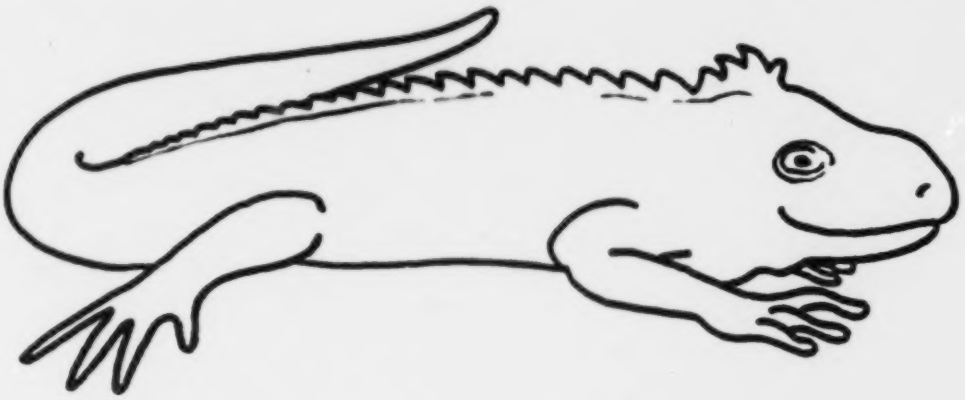
macaw

E442

iguana



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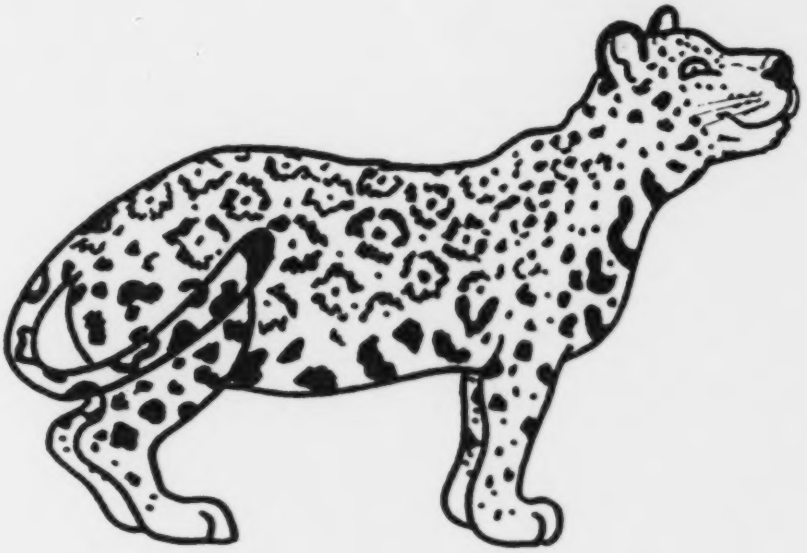
jaguar



E442

Let's Conserve Air, Land and Water

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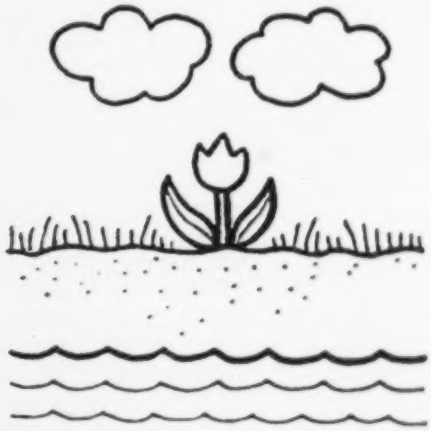

E 443

Don't use aerosol spray.

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Ride a bike!

E443

Don't pollute streams.

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Save water!

E 443

Don't litter the ground.

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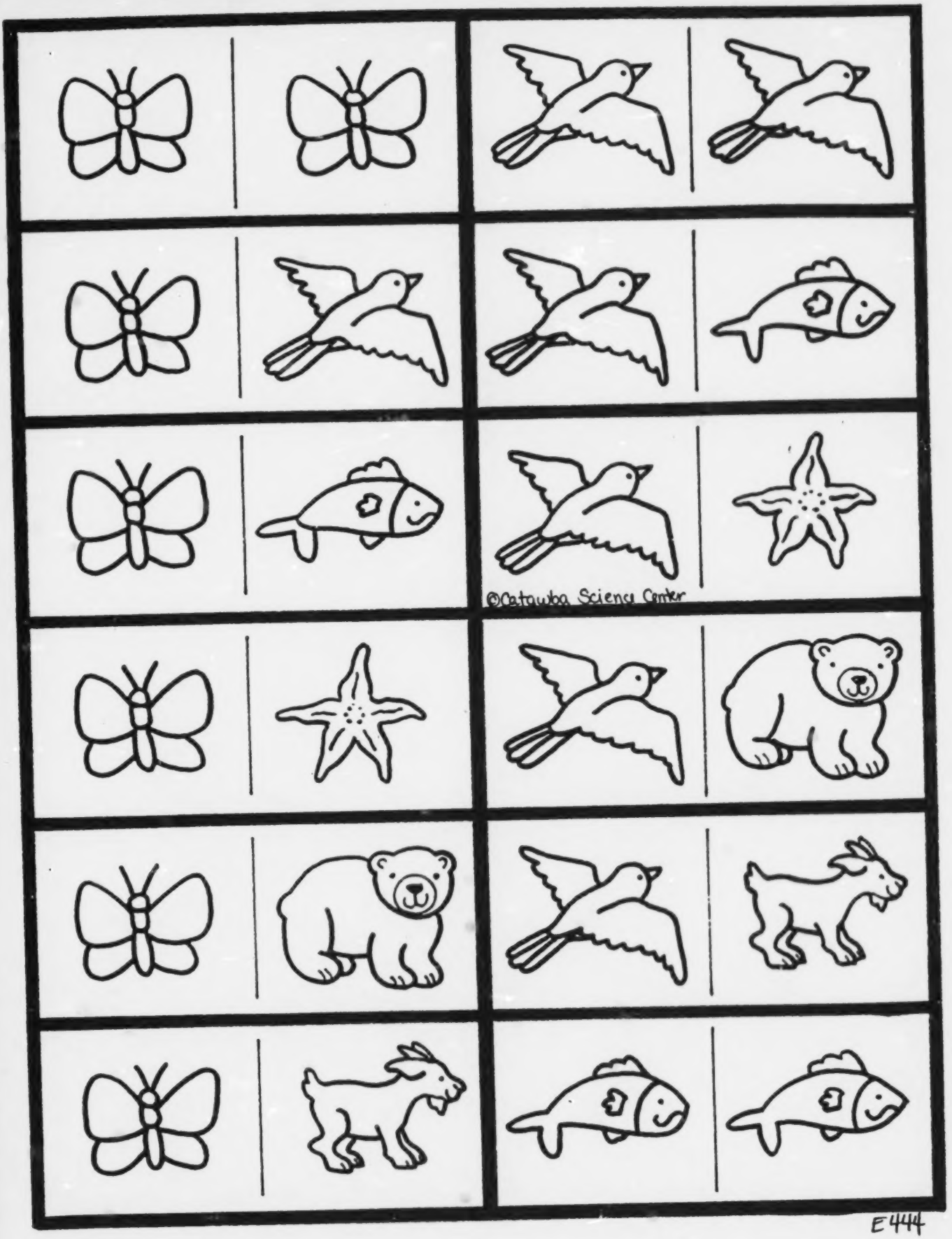
Plant a tree!

E443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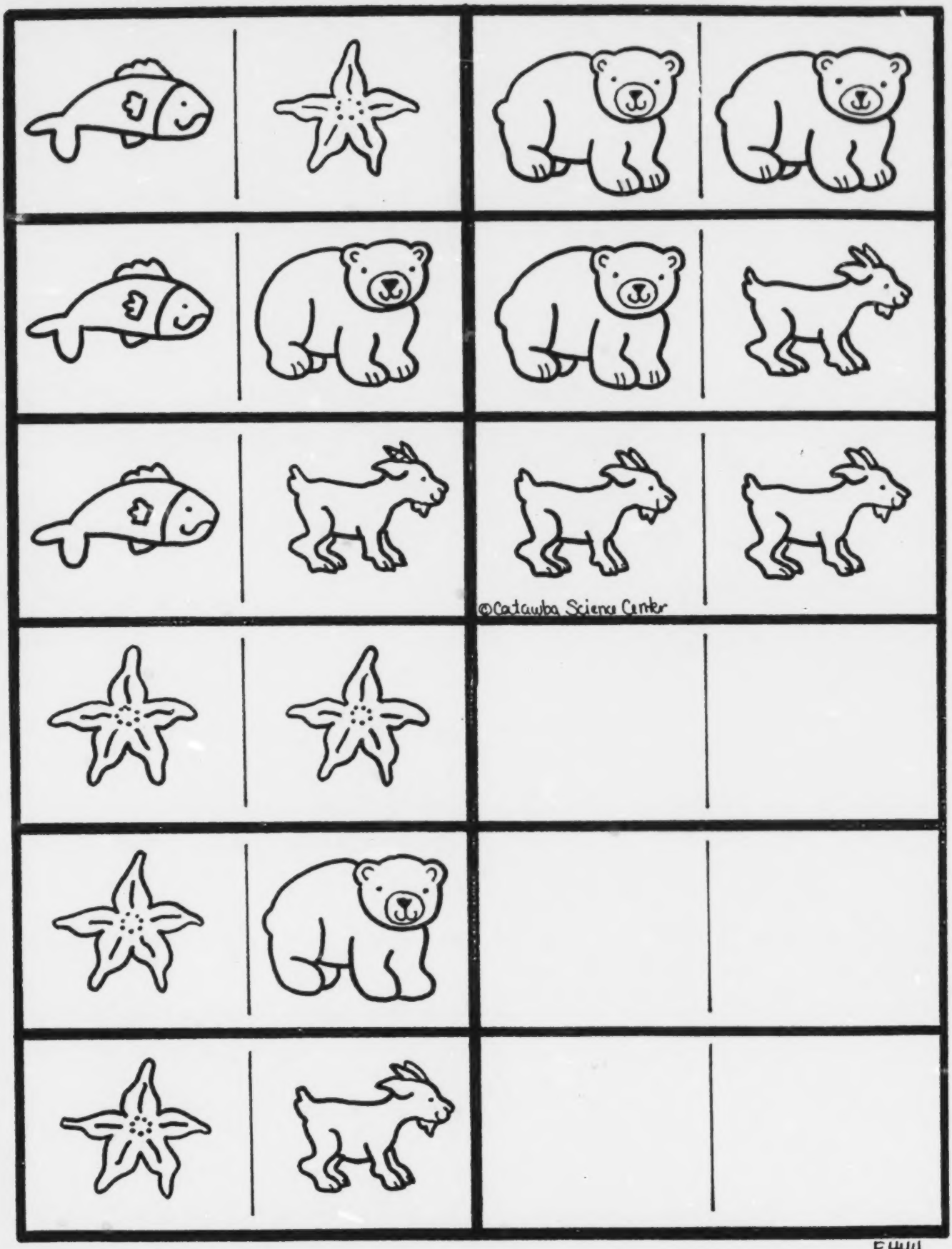
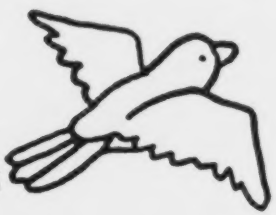
E444



E444

I can conserve by...



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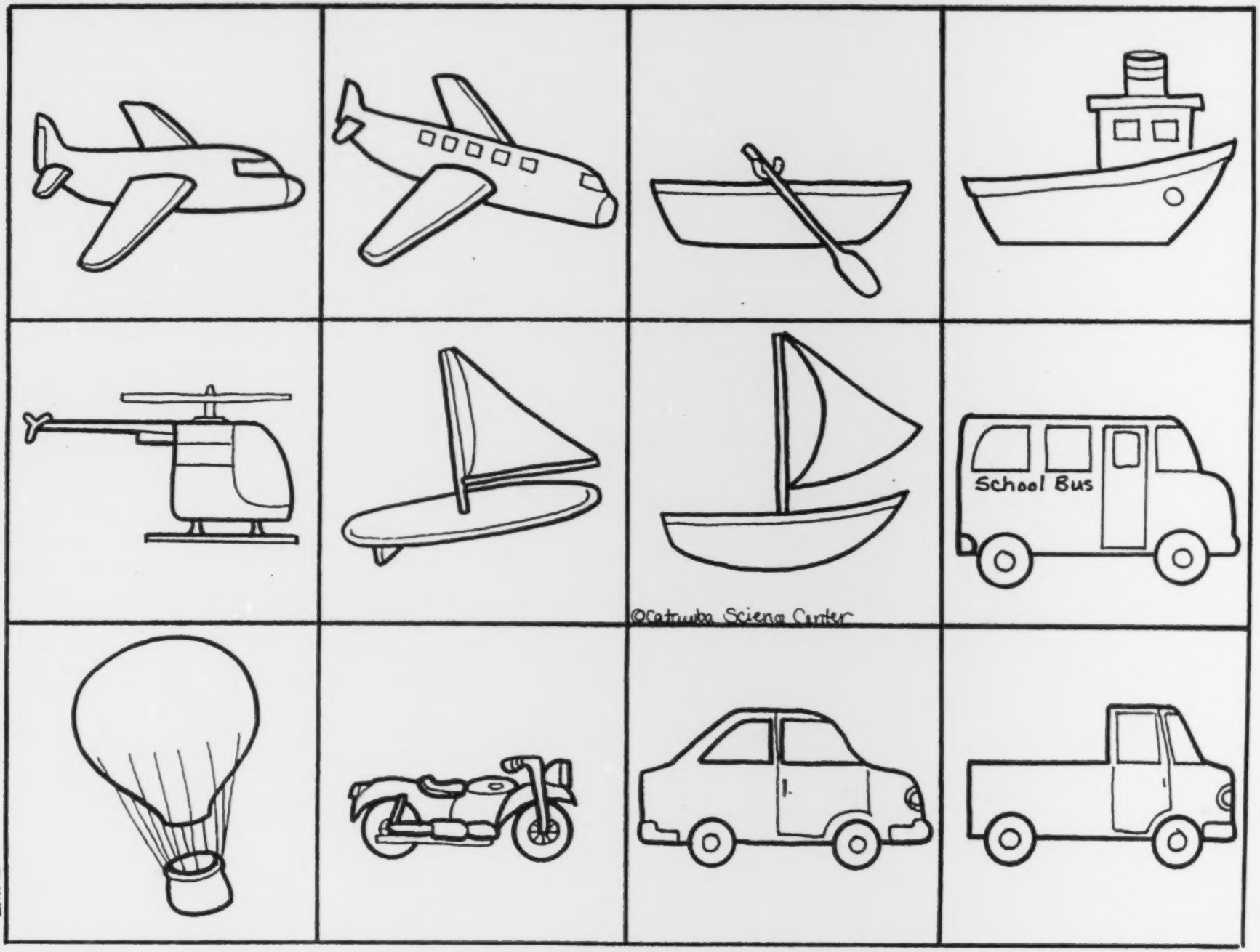

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Transportation

air	land	water

LH3

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65

66

Animals

air	land	water

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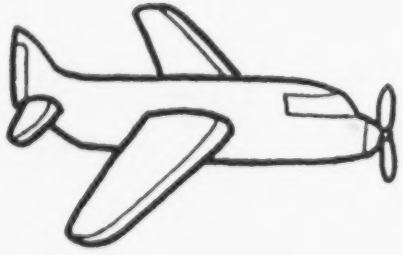

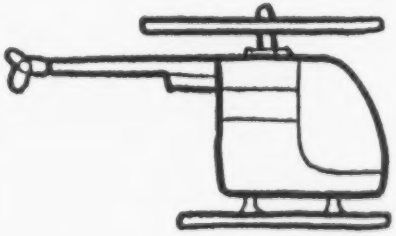

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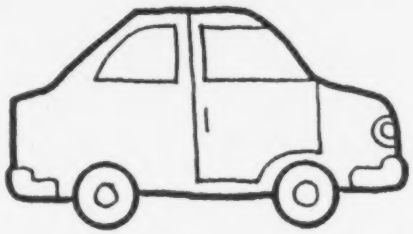

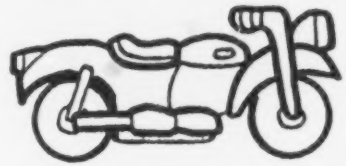

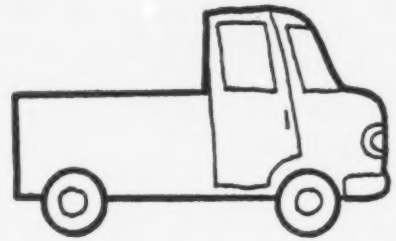

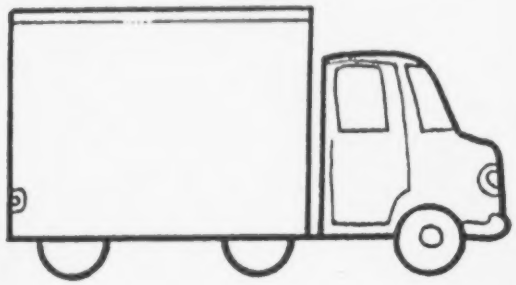

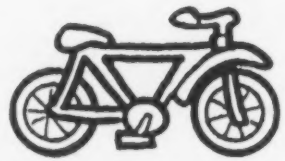

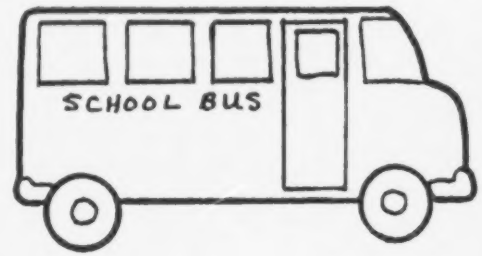

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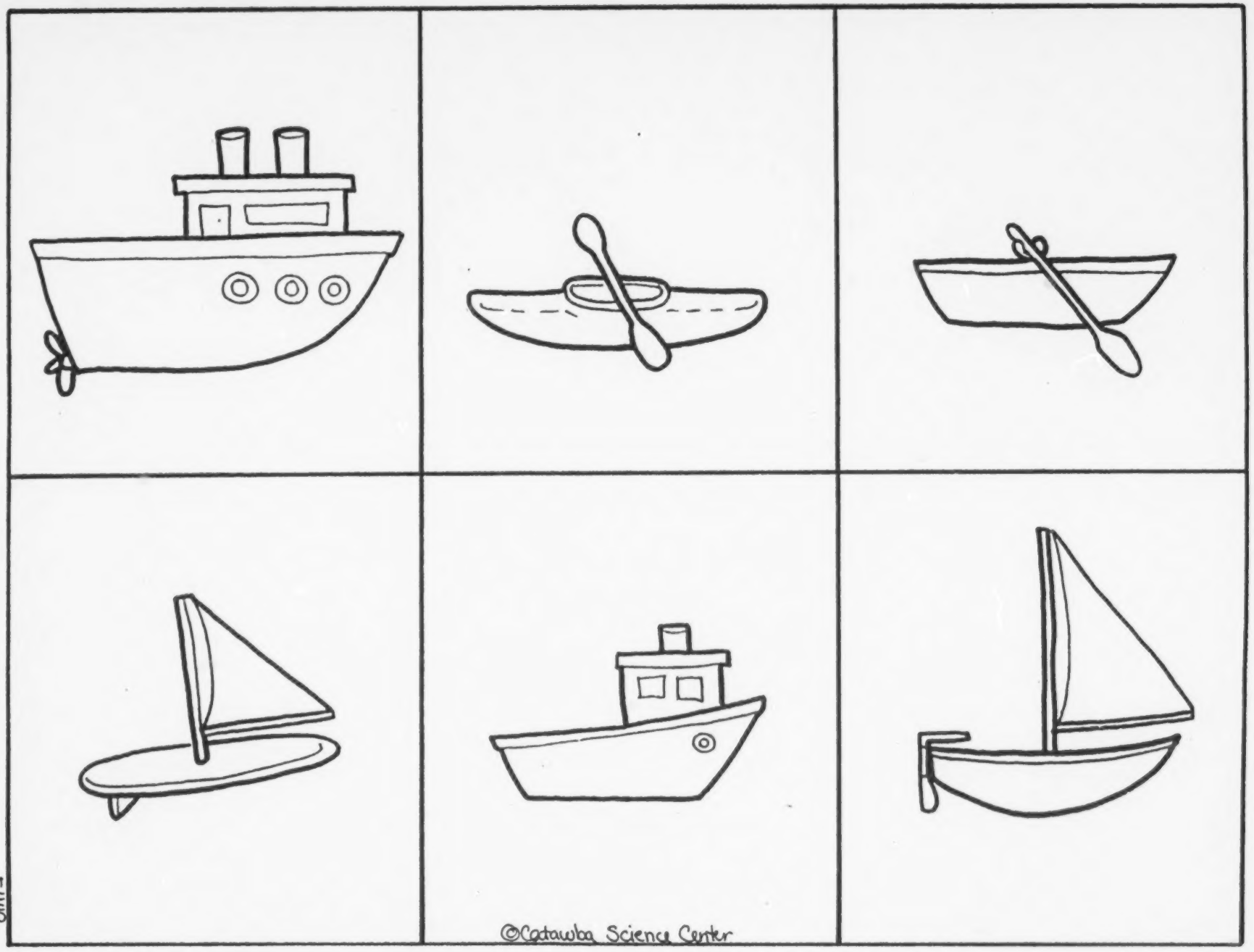

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boats

Earth Science

Teacher Resource Activities

Four-Year-Olds

EARTH SCIENCE
RESOURCE KIT
Four Year Olds

Session 1: Air takes up space.

1. Use one copy of each pattern numbered E411. Color the lotto boards showing a variety of items inflated and deflated. Be sure to color each pair of items identically. Cut apart the inflated items into cards. Let children match these to the deflated pictures on the lotto board. Remind children that air takes up space and ask what we need to do to inflate things. To increase the difficulty, cut out all the pieces and let children match.

2. Use one copy of the pattern numbered E412. Color and cut out the cards sequencing inflating the inner tube. Ask children to put the cards in order.

3. Let children see you inflate a beach ball. Remind them that it gets bigger as you fill it with air because air takes up space.

4. Use the playground ball that children will help to inflate during the teaching session. Ask children how the ball got big, or inflated.

Session 2: Water has special characteristics.

1. Use medicine droppers to let children experiment with absorption and dissolution. Put out a variety of objects that children can drop water onto to check for absorption. Be sure to include both objects that absorb and those that don't. For dissolution, several cups (or mini cupcake tins) can be placed in a center with a different substance in each. Include some things that do not dissolve as well as those that do. Let children drop water onto each item to see if it dissolves.

2. Let the children use the ABC sponges to experiment with absorption and evaporation. Let children see if the sponges absorb water. Encourage children to weigh the sponges when they are wet and when they are dry to see which weighs more. Once sponges are wet, let children check to see how long they take to dry. Put some outside, some in the refrigerator, and some in different spots around the room. Help children determine which dries fastest. Remind them that when the sponges dry, the water is evaporating.

3. Put the expanding capsule creatures into water. Let them sit for several hours and even overnight. Let children check for absorption. Take the capsules out of the water and let water evaporate so that the creatures shrink to original size.

4. Use one copy of the pattern numbered E424. Color and cut out the sequence pictures of absorption, evaporation, and dissolution Let children put the pictures in order.

Session 3: Some rocks are fossils.

1. Use one copy of each of the patterns numbered E431. Leave the dinosaur skeleton sheet as a lotto board. Color and cut out the dinosaur heads that match the skeletons. Let children match the dinosaurs to the correct skeleton. To increase the difficulty, cut out both sheets into cards and let children find those that match.

2. Use seven copies of the pattern numbered E432; one each white, red, orange, yellow, green, blue, and purple. The dinosaur cards can be used in several ways. One of the colored sheets can be left whole to be used as a lotto board. The other sheets can be cut into cards and used to match to the lotto board. The different dinosaur cards can all be cut out and used for children to sort by color or by type of dinosaur. In addition, one card of each color can be placed in a bucket or section of a sorting tray. Children can use these to sort the plastic dinosaurs by color. The white dinosaur board can be cut and used to help children sort the plastic dinosaurs by type. One card can be placed in each section of a sorting tray or in buckets.

3. Use plastic fossils for hiding in dirt or sand. Let children pretend to be paleontologists hunting for fossils. Let children match them by type of fossil as they are found.

4. Make or purchase dinosaur tracers place in the art center. Let children freely create dinosaurs. Provide paper, pencils, crayons, markers, glue and a variety of objects for decorating the dinosaurs.

5. Use one copy of the pattern numbered E345. Duplicate one for each child. Let children finish the sentence "If I were a paleontologist..." by drawing a picture. Once they are finished, ask them to tell you about their picture. Write their response on the paper. Collect the drawings from all the children in the class, make a cover sheet for the story, and staple the stories together to make a book. Read the book to the class and then place the book in the story center for the children to use.

6. Use one copy of the pattern numbered E436. Color and cut out the pictures sequencing the fossil dig. Let children put them in order.

7. Use one copy of each of the patterns numbered E437. Color and cut out the book "Fossils Tell a Story." Read the book to the class and then place in the story center for children to use.

Session 4: Conservation.

1. Let children use the land and sea animals provided for sorting. Remind children that keeping the land and water clean helps the animals who live there stay healthy.

2. Use one copy of each of the patterns numbered E442. Color and put together the book "Rainforest Animals." Read the book to the children and then put it in the story center for children to use.

3. Use one copy of each of the patterns numbered E443. Color and put together the book "Let's Conserve by..." Read the book to the children and then place the book in the story center for children to use.

4. Use one copy of each of the patterns numbered E444. Color and cut out the animal dominoes. Let children match the animals. Talk to children about where each animal lives. Remind the children that we can help the animals by taking care of the air, land, and water.

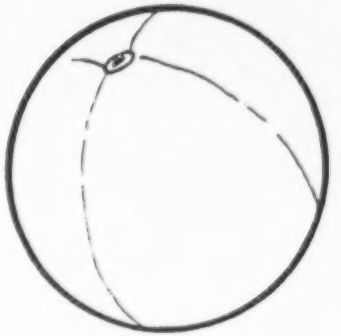
5. Duplicate for each child a copy of the pattern numbered E445. Let the children finish the story starter "I can conserve by..." with a picture showing how they can conserve. As children tell you about their pictures, write down their descriptions of what they drew. Collect the drawings from all the children in the class, make a cover sheet for the story, and staple the stories together to make a book. Read the book to the class and then place the book in the story center for the children to use.

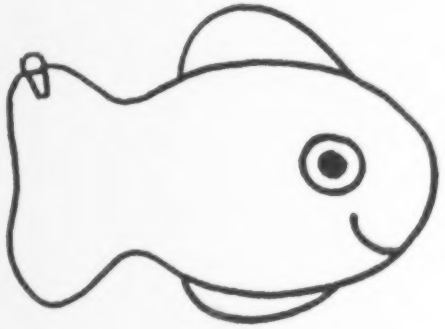
6. Color the two copies of pattern number E446 of rainforest animals exactly the same. Cut out one sheet into cards. Leave the other sheet whole to be used as a lotto board. Let children match the cards to the lotto board.

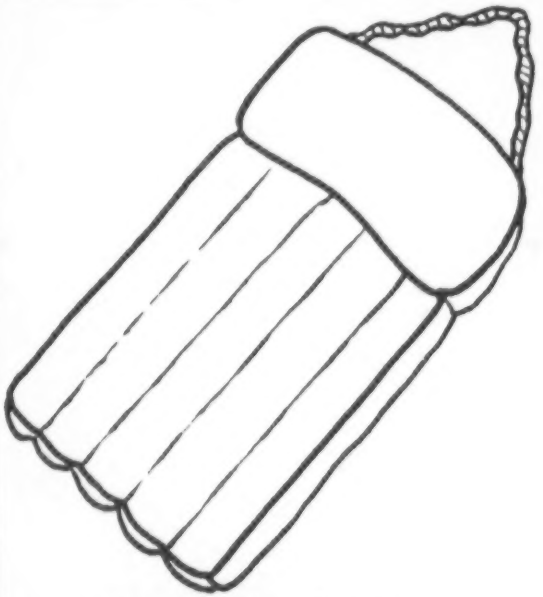
7. Use one copy of each pattern numbered E447. Leave whole the sheet that is to be used as the sorting board. Color and cut out the transportation vehicle cards. Let children sort onto the sorting board those that travel on land, those that travel by sea, and those that travel by air.

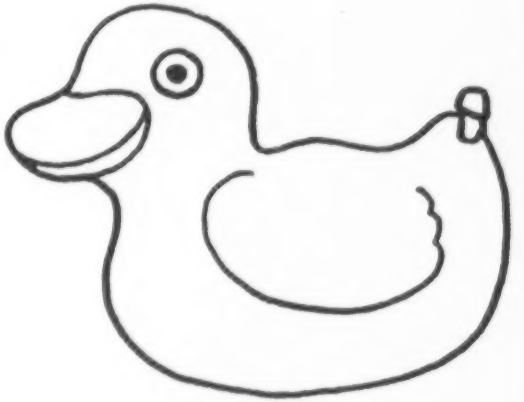
8. Use one copy of each pattern numbered E448. Leave whole the sheet that is to be used as the sorting board. Color and cut out the land, sea, and air animals. Let children sort the animals onto the sorting board. Remind children that we need to keep the air, land, and water clean for the animals.

9. Use two copies of each of the patterns numbered E449. Color the sheets of the vehicles that travel in air, on land, and in water. Leave whole one sheet in each set to be used as a lotto board. Cut apart into cards the other sheet in each set and let children match to the lotto board. To increase the difficulty, mix all three sets of cards together and then let children find the ones that match their lotto board.









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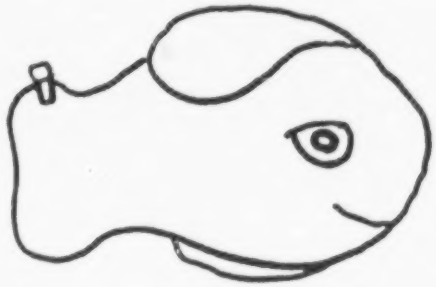

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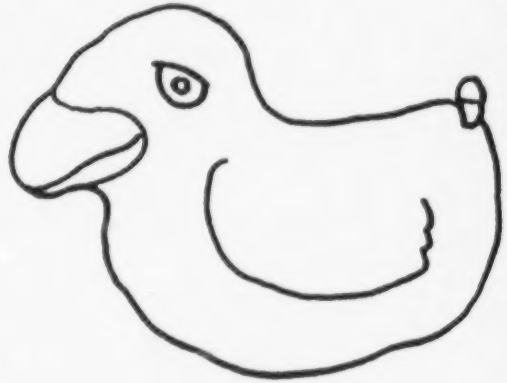

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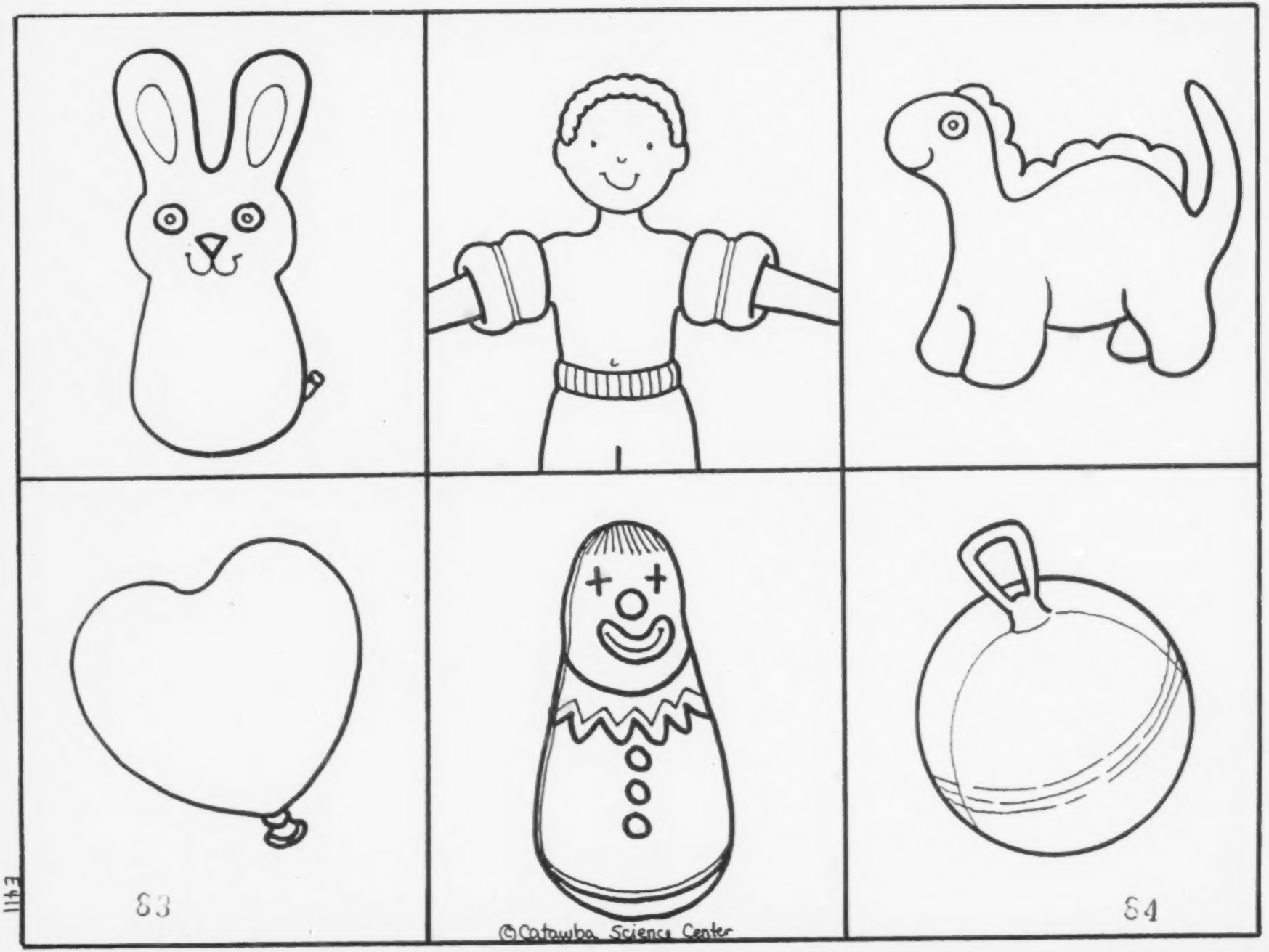
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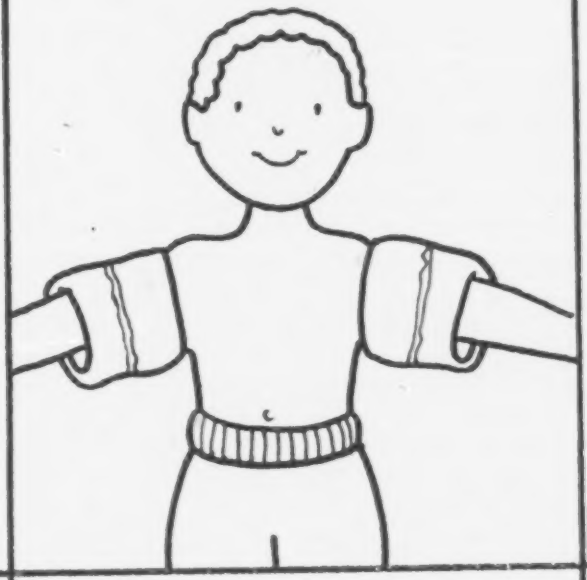

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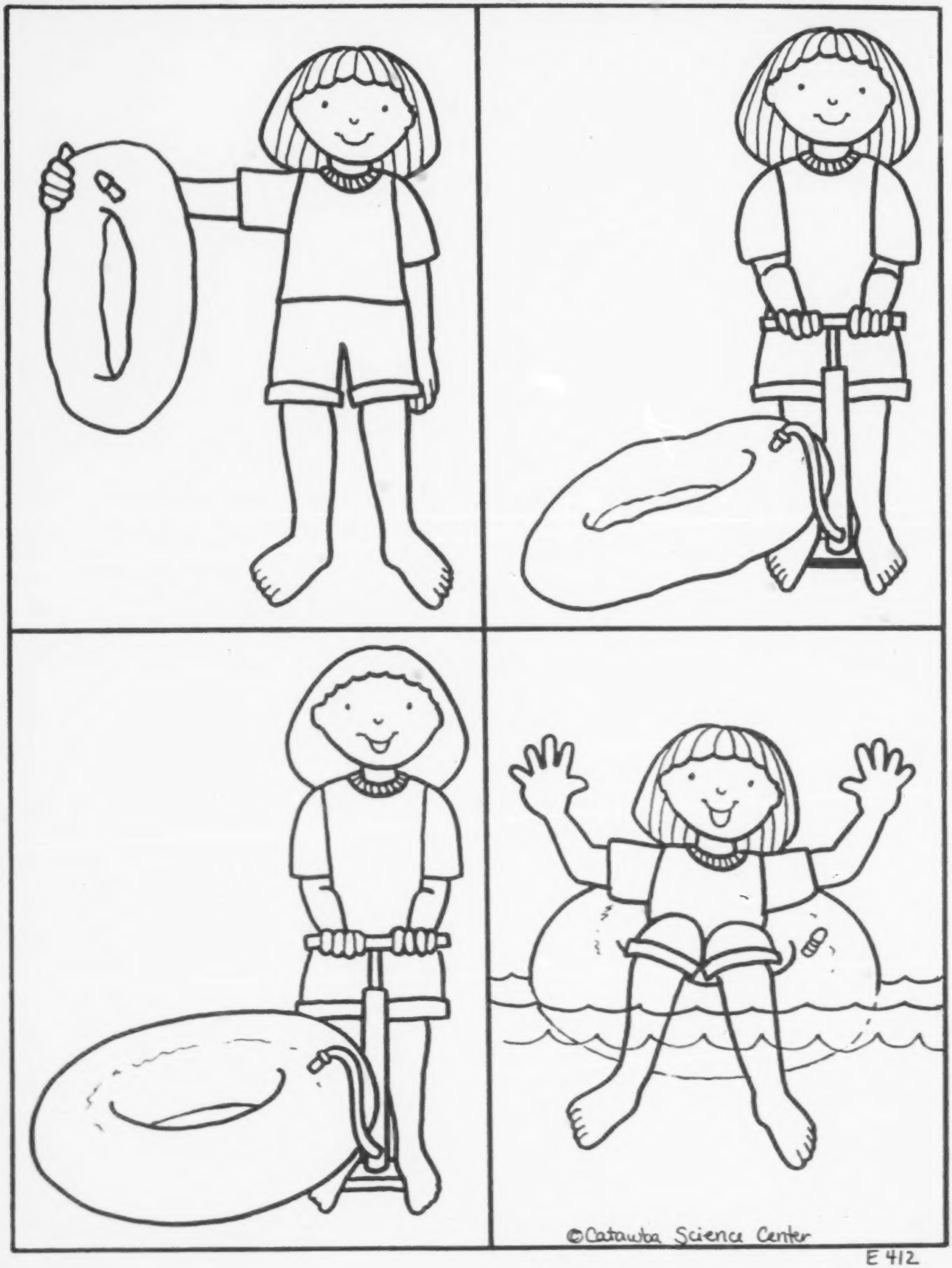
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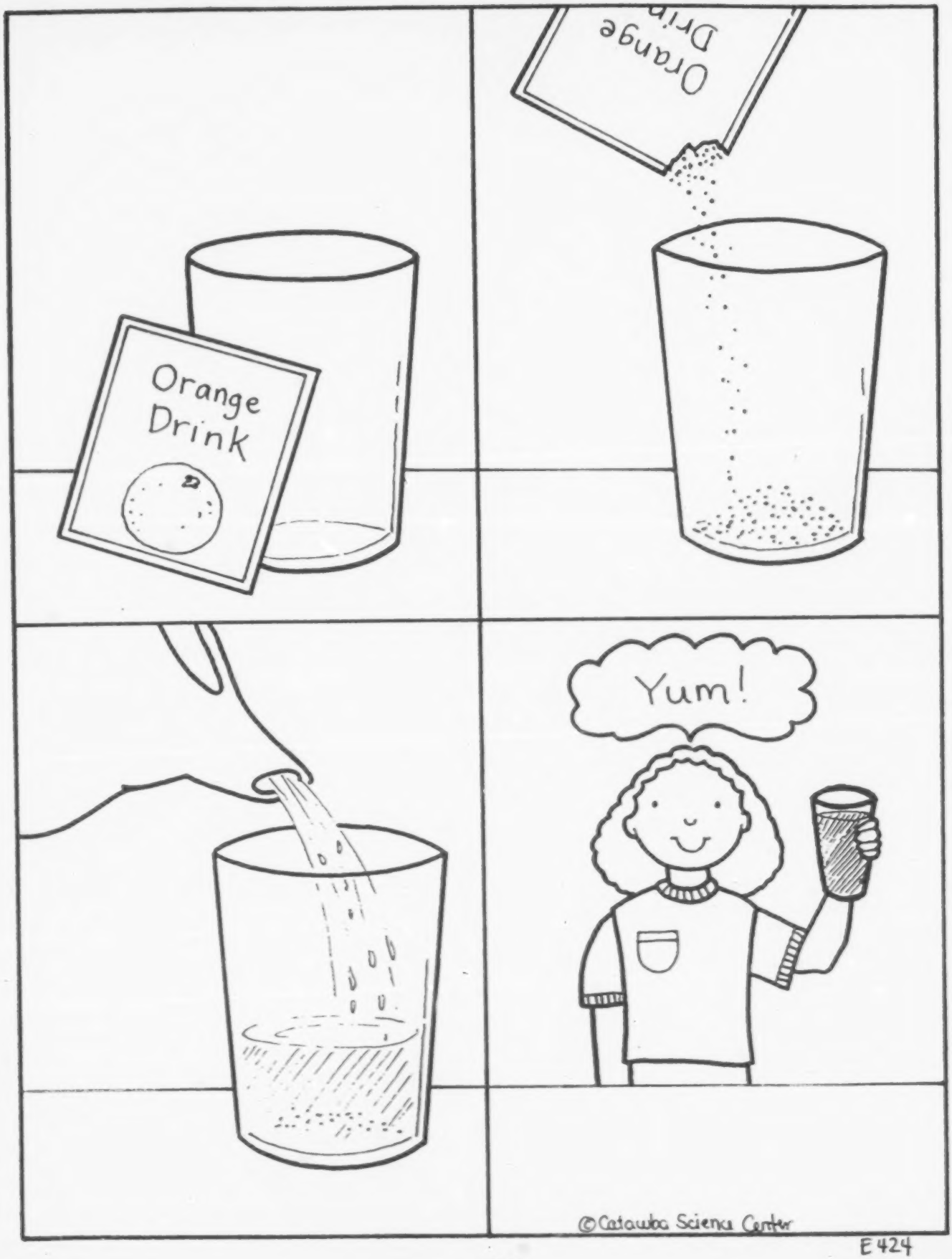

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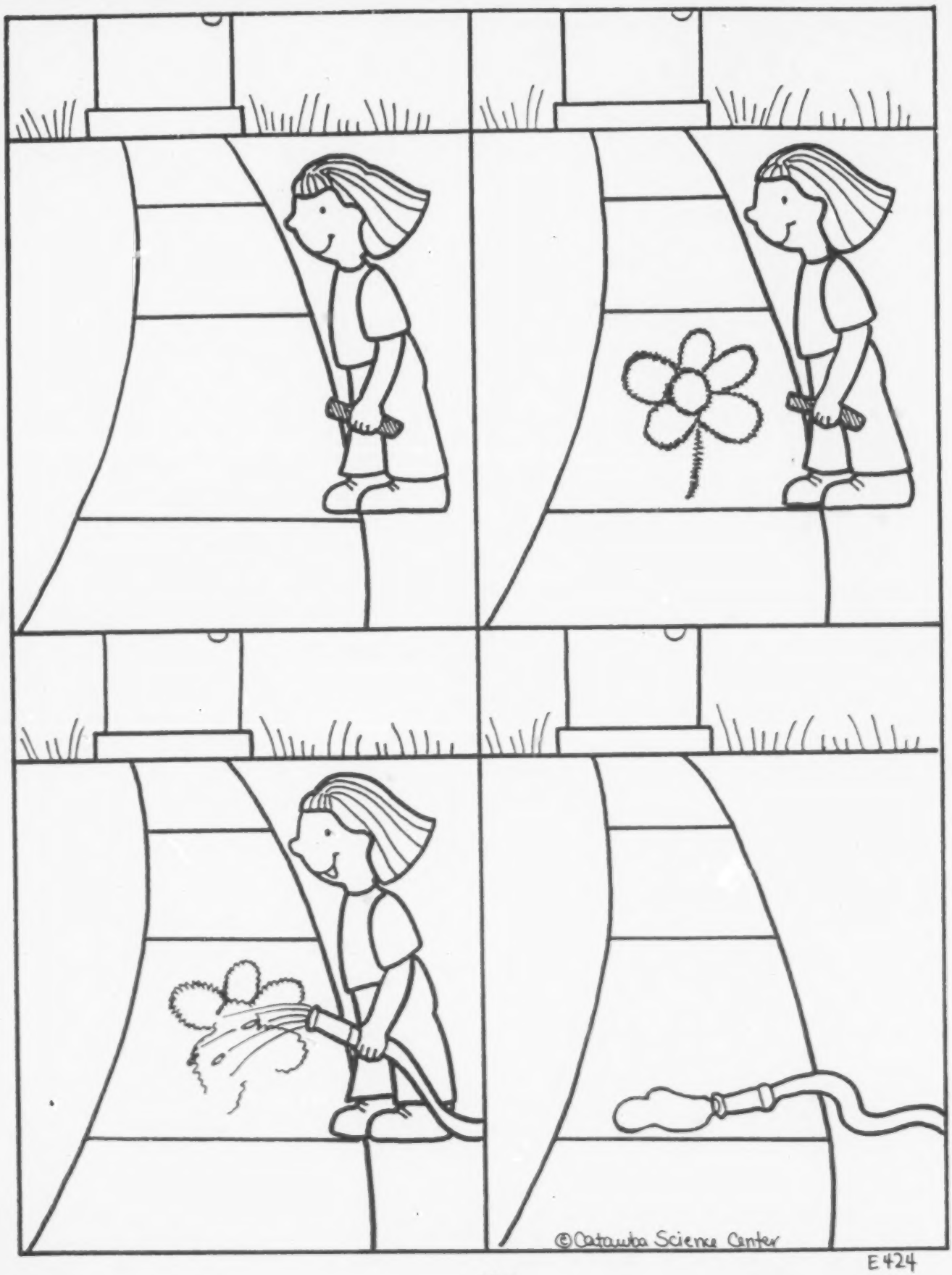
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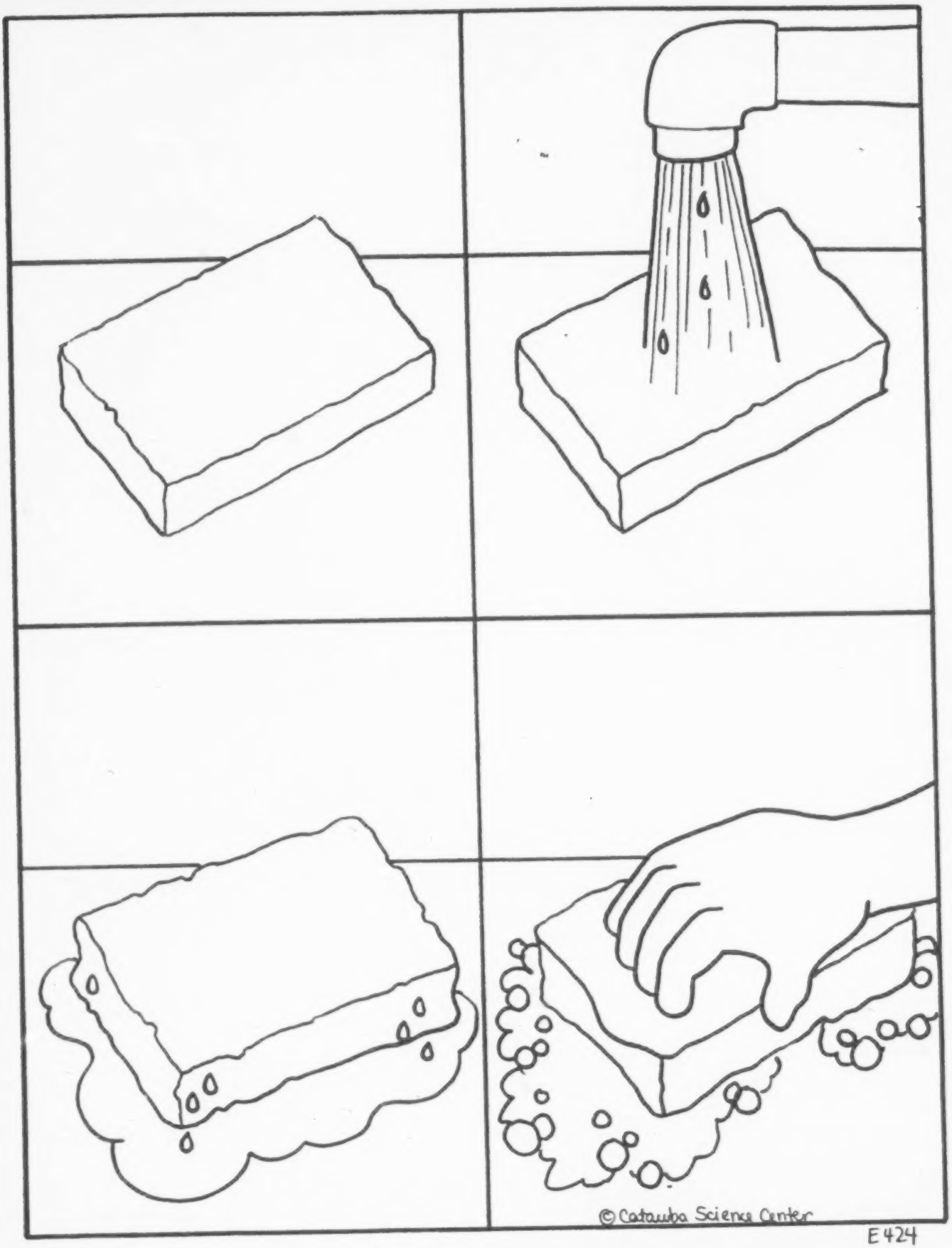
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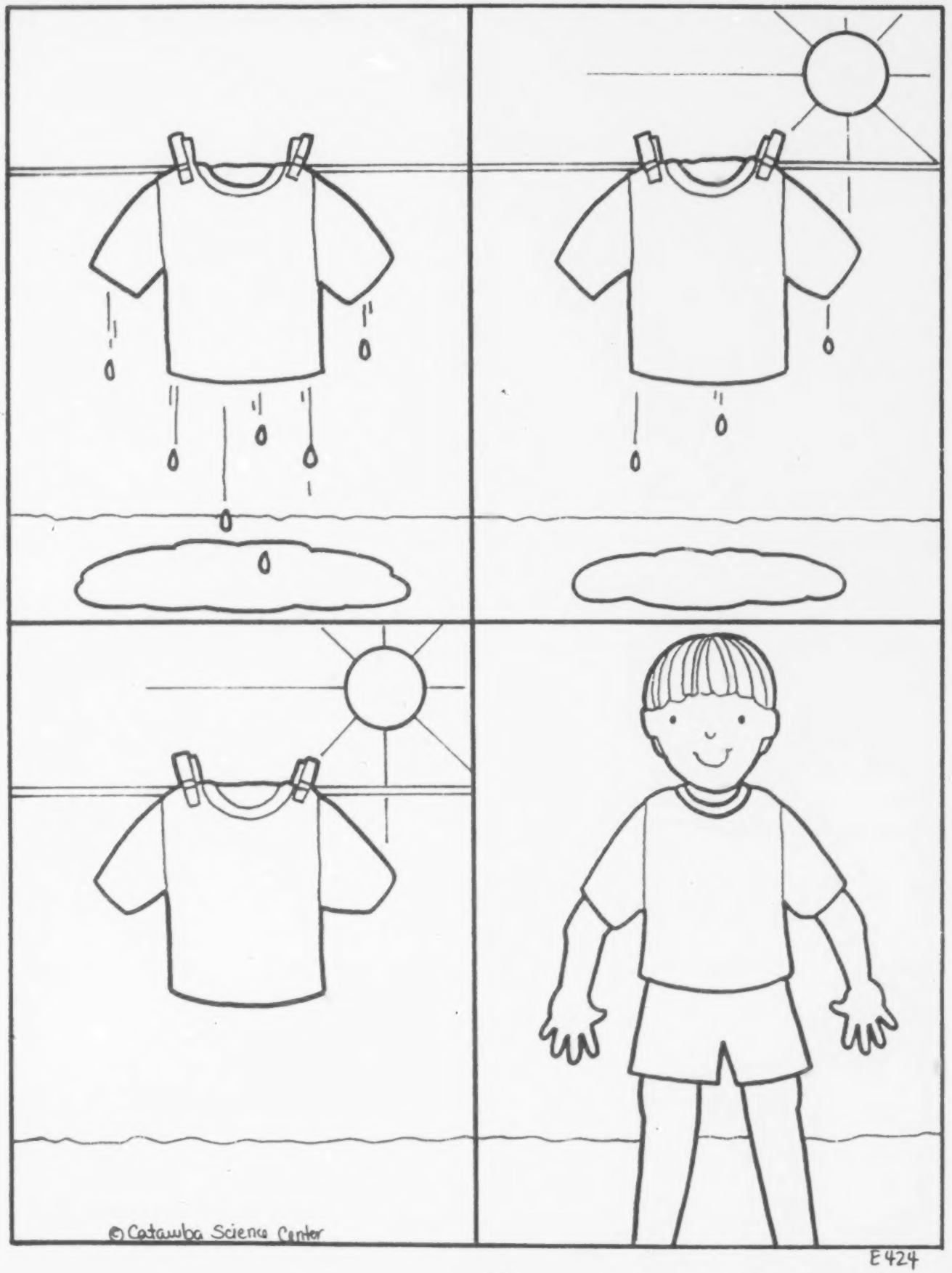
E 424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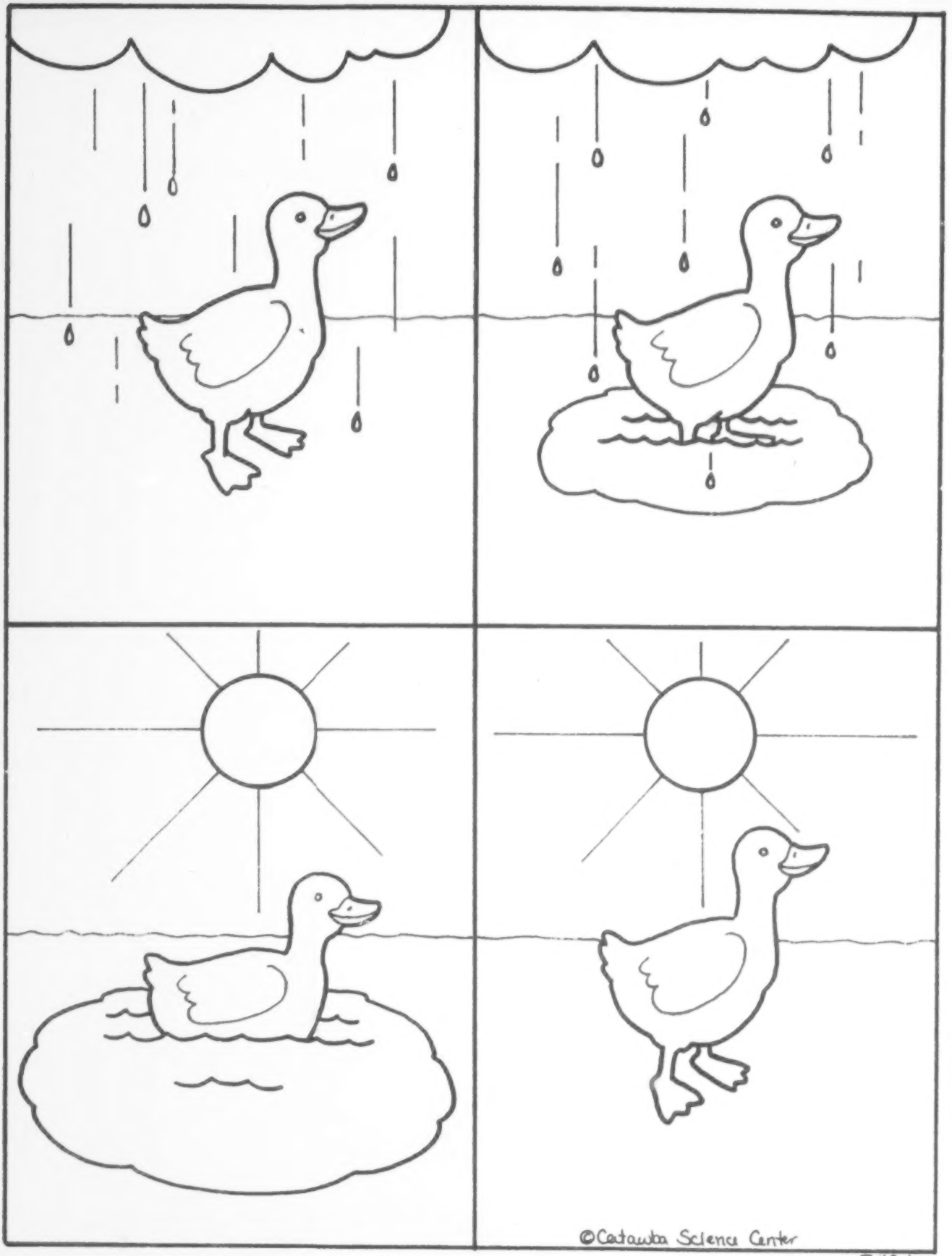

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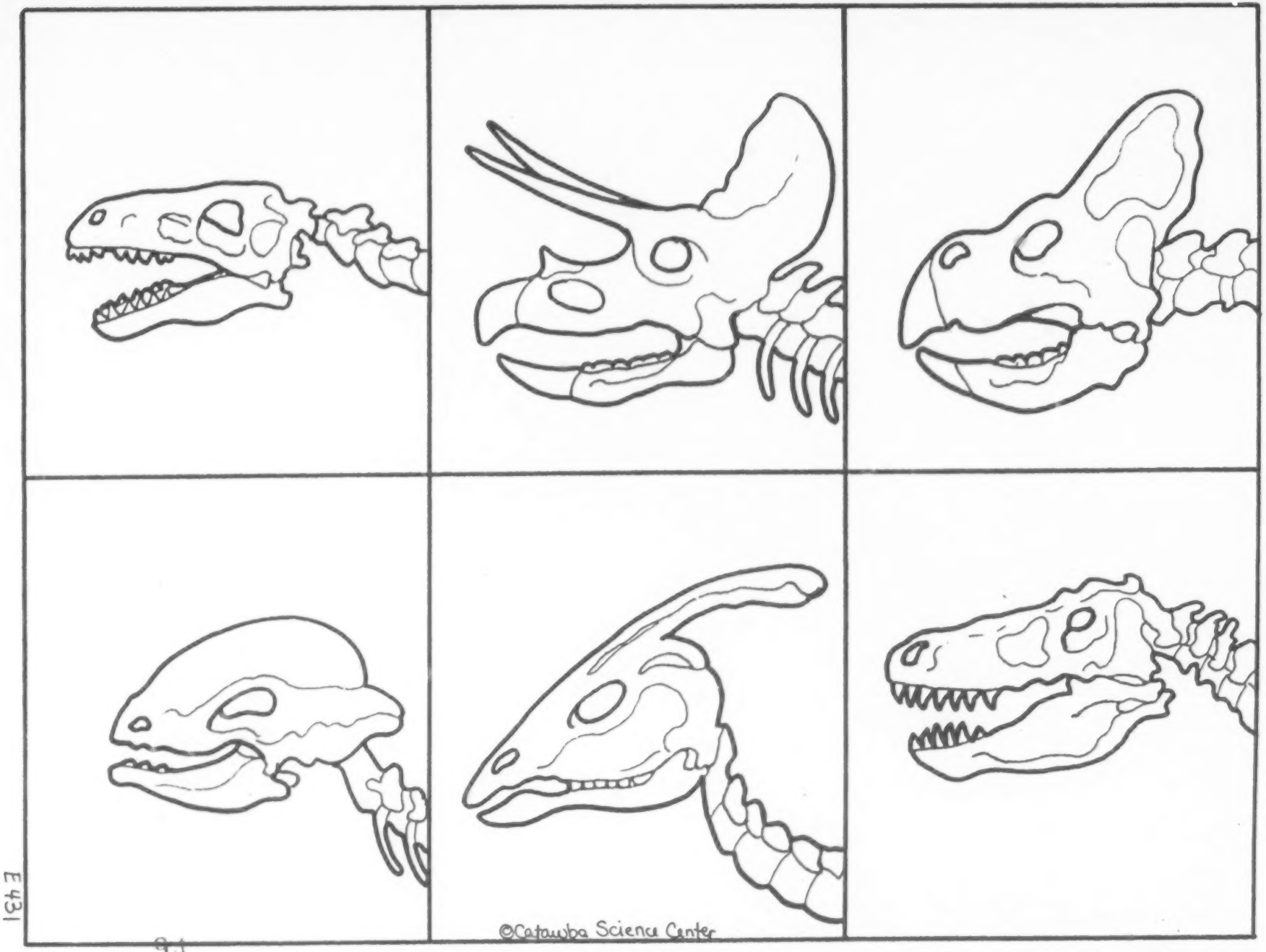

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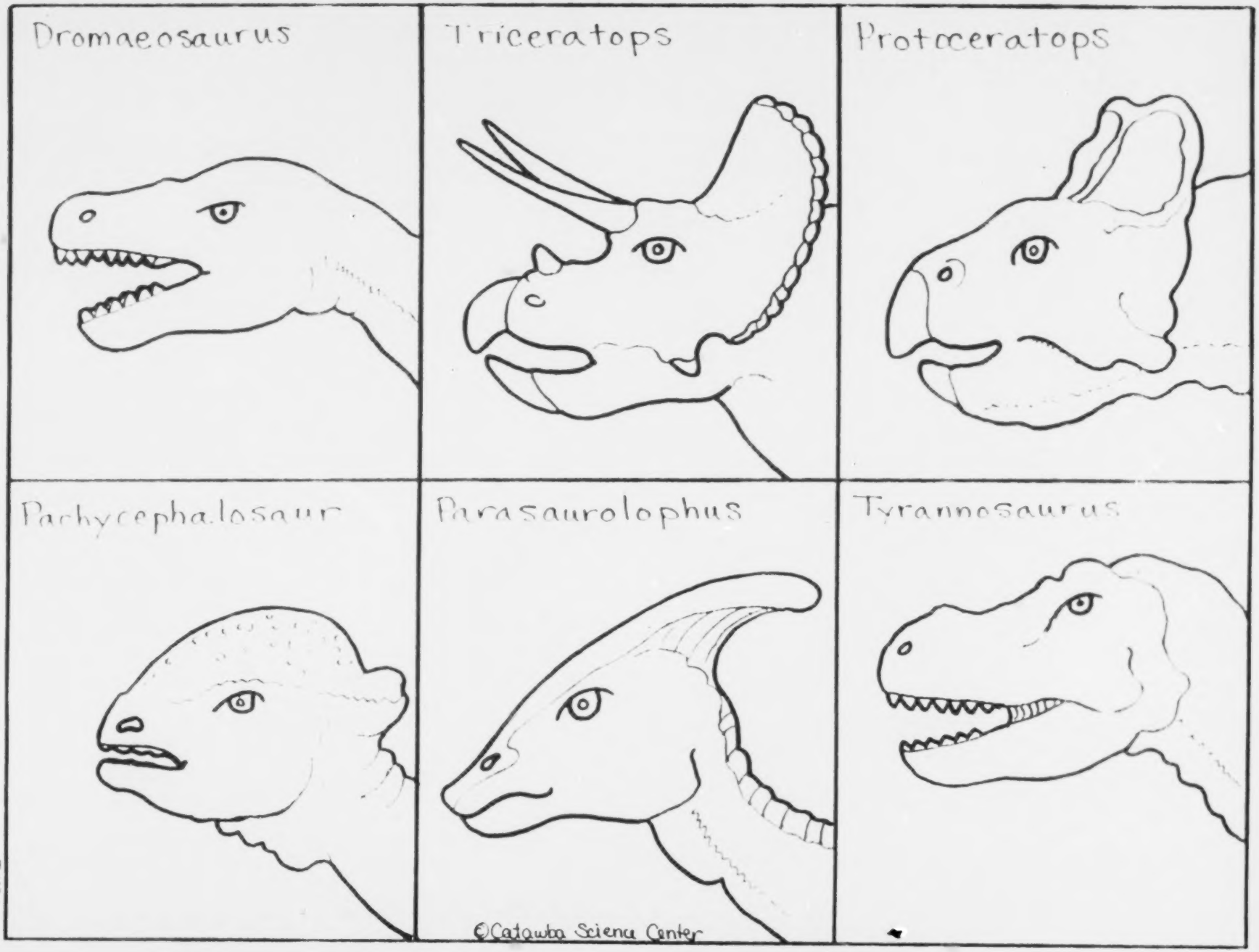
Dromaeosaurus
Triceratops
Protoceratops
Pachycephalosaur
Parasaurolophus
Tyrannosaurus
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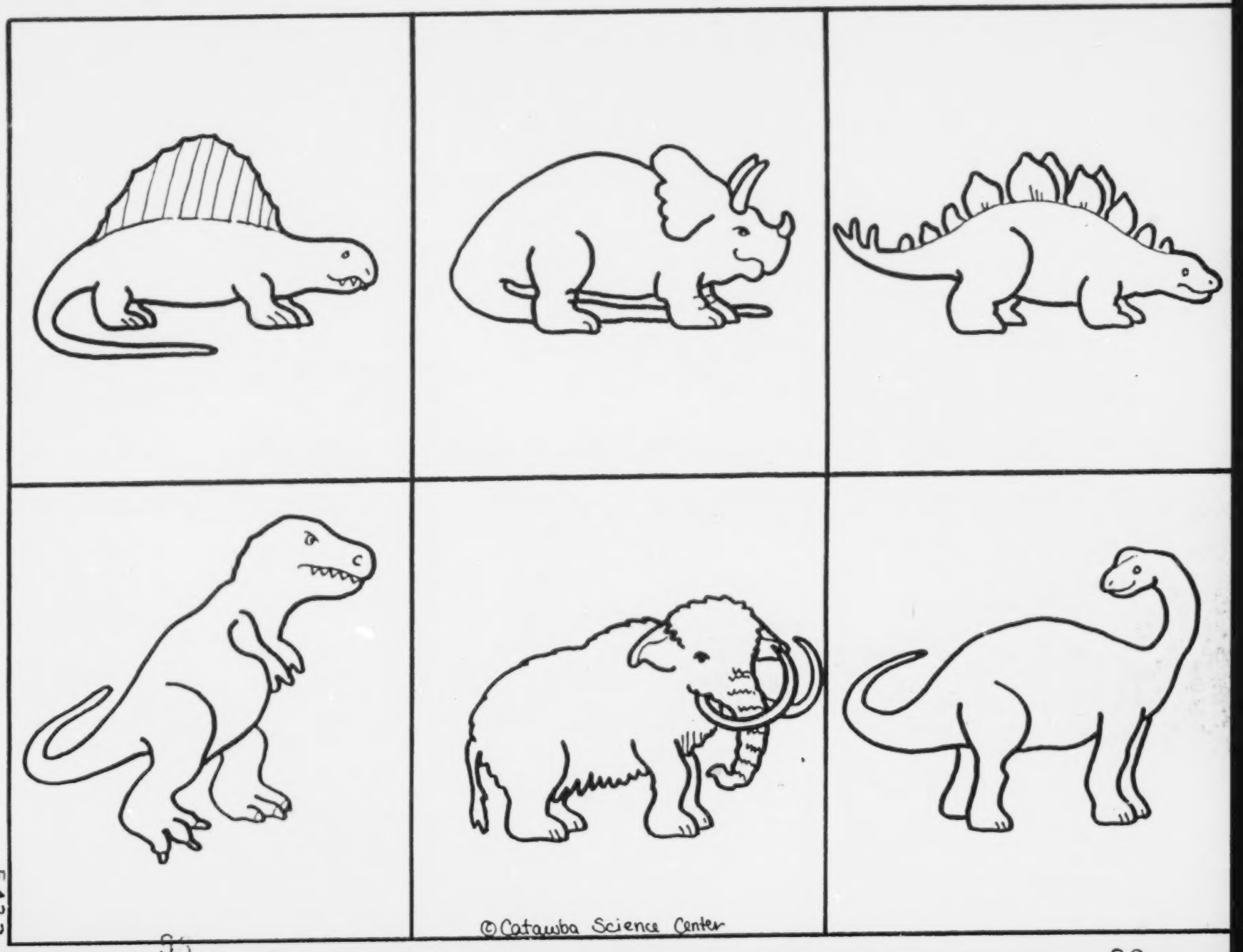
E431



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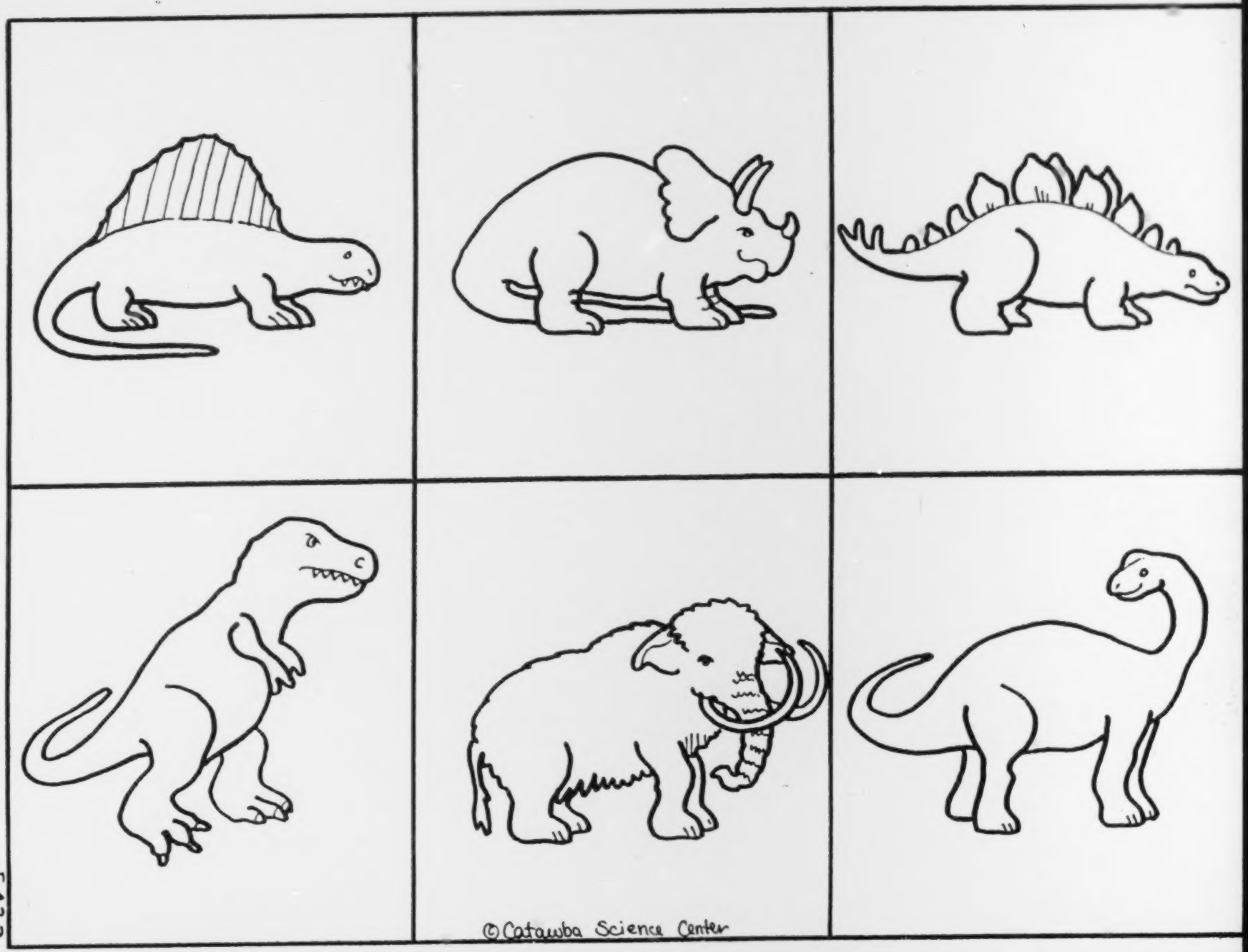
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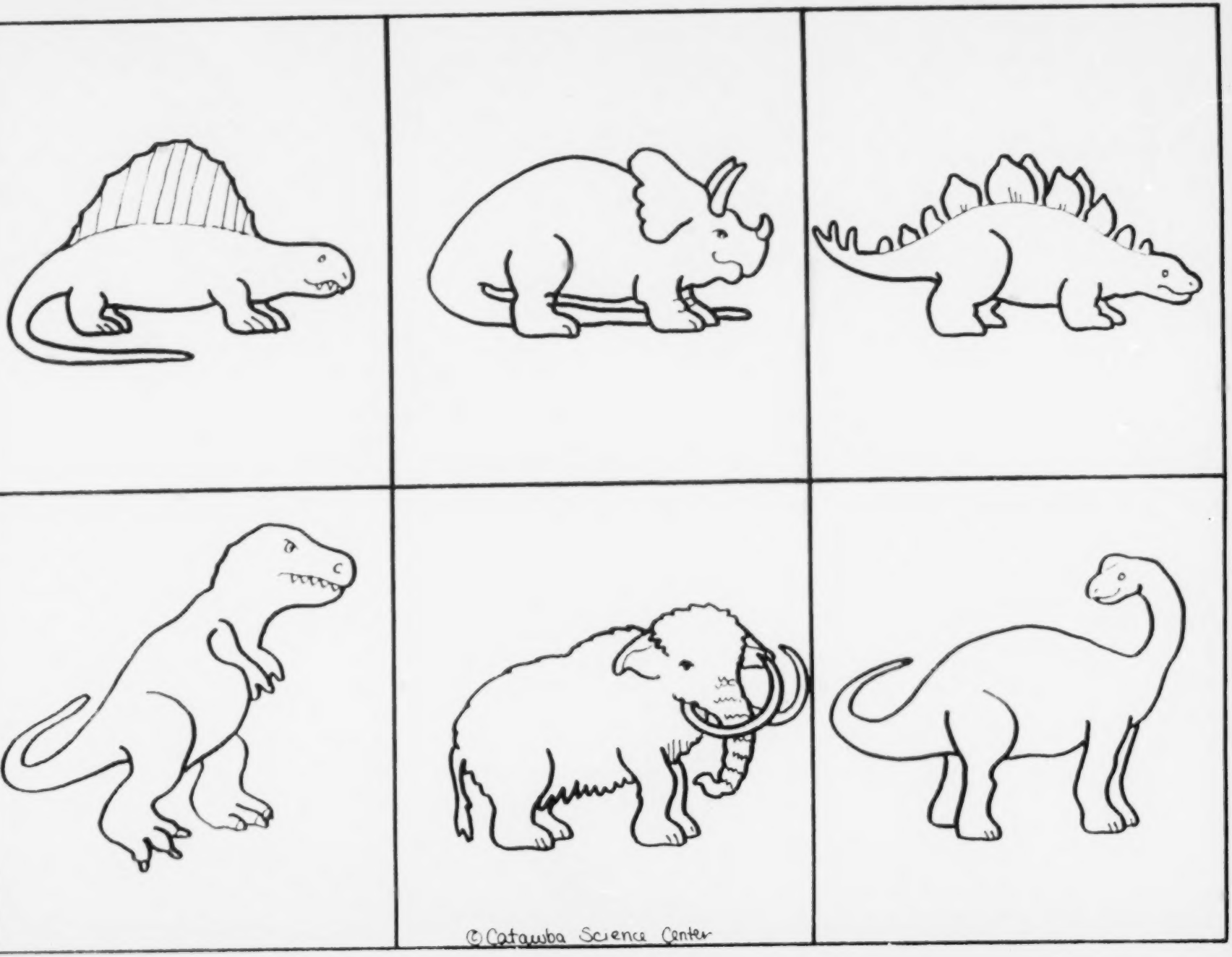
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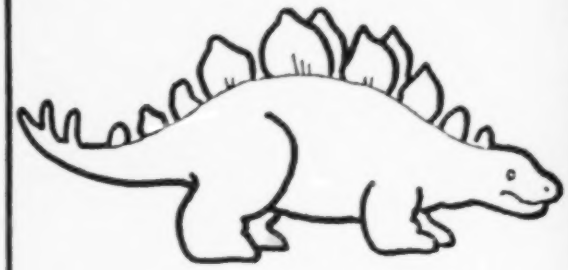

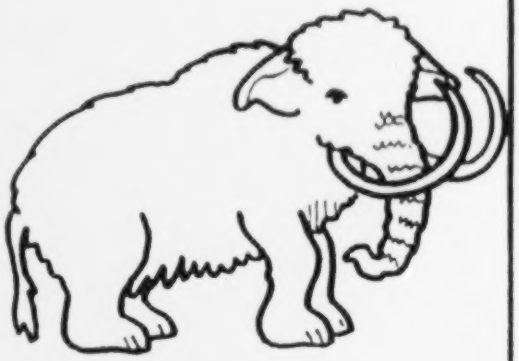

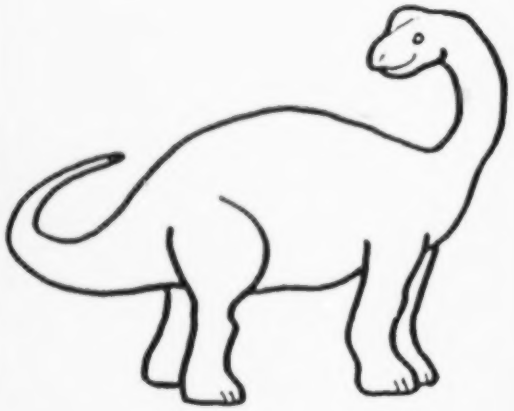

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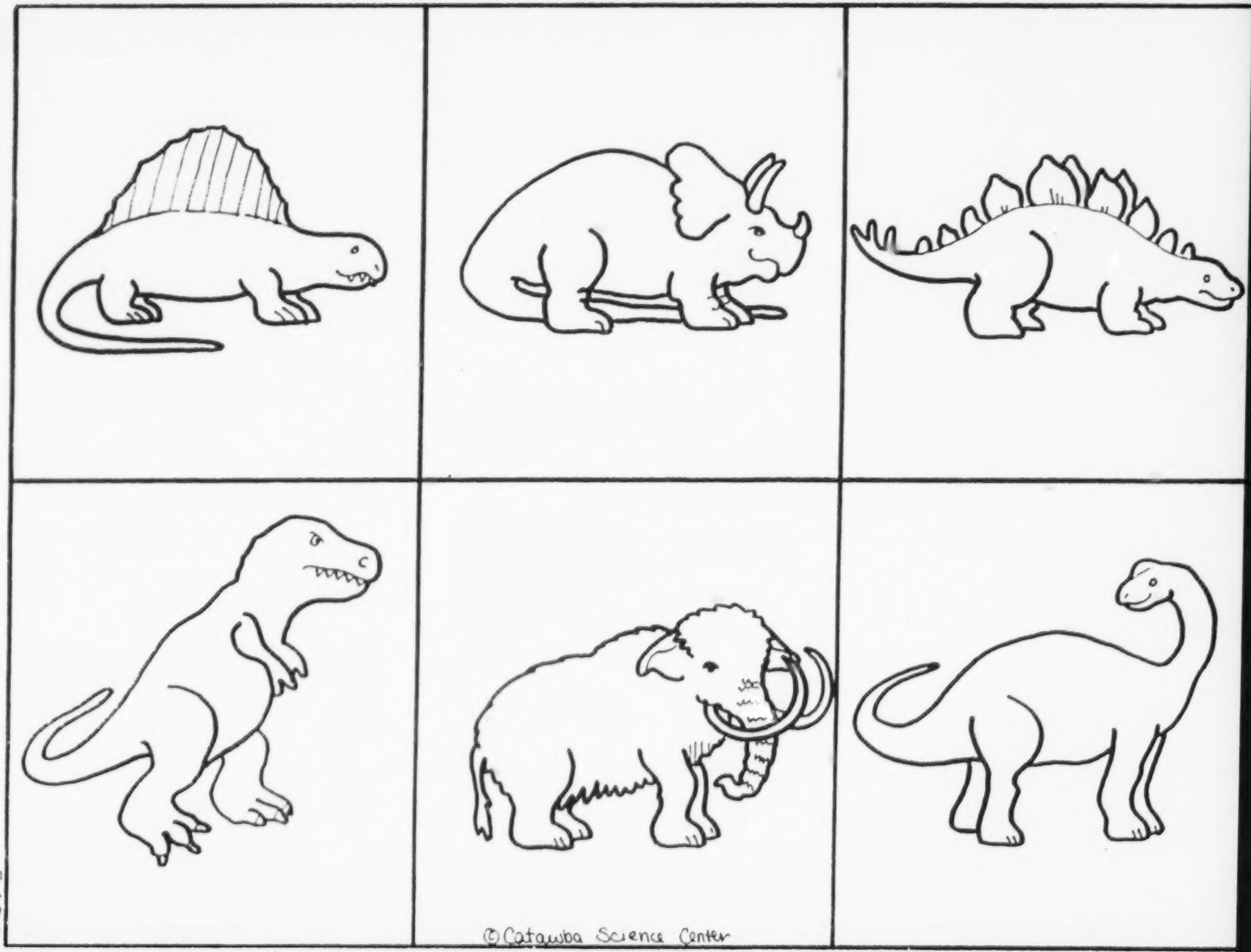

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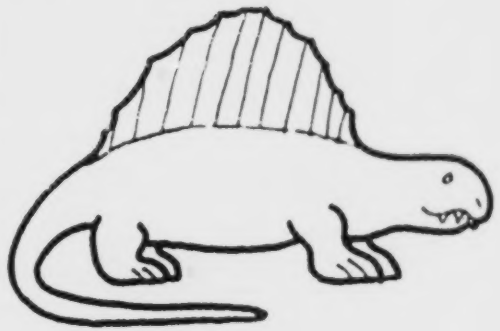

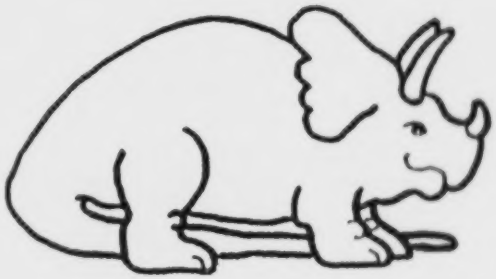

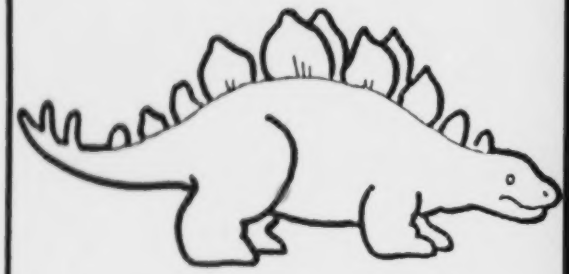

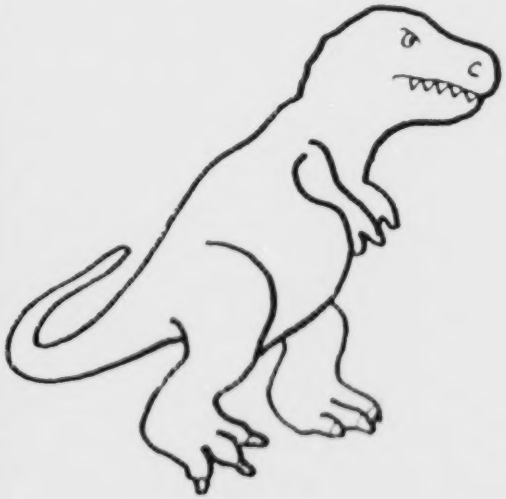

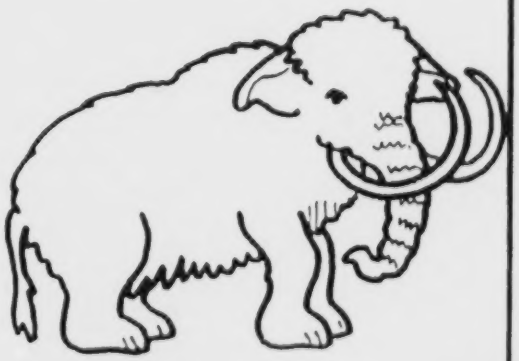

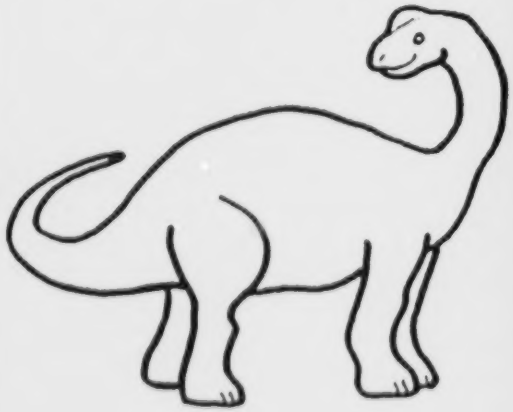

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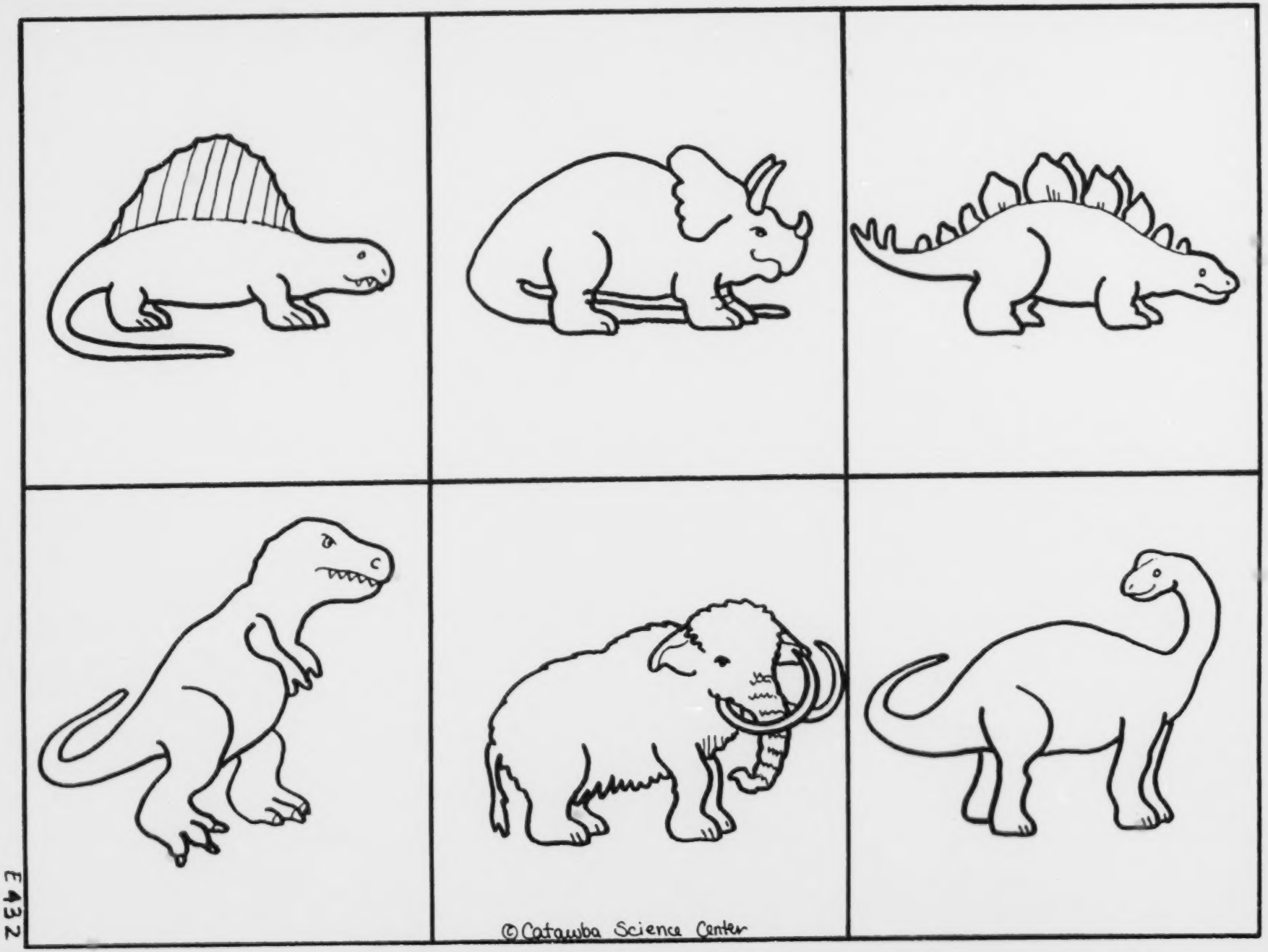

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E432

If I were a palentologist
I would like to find . . . . . .

E435

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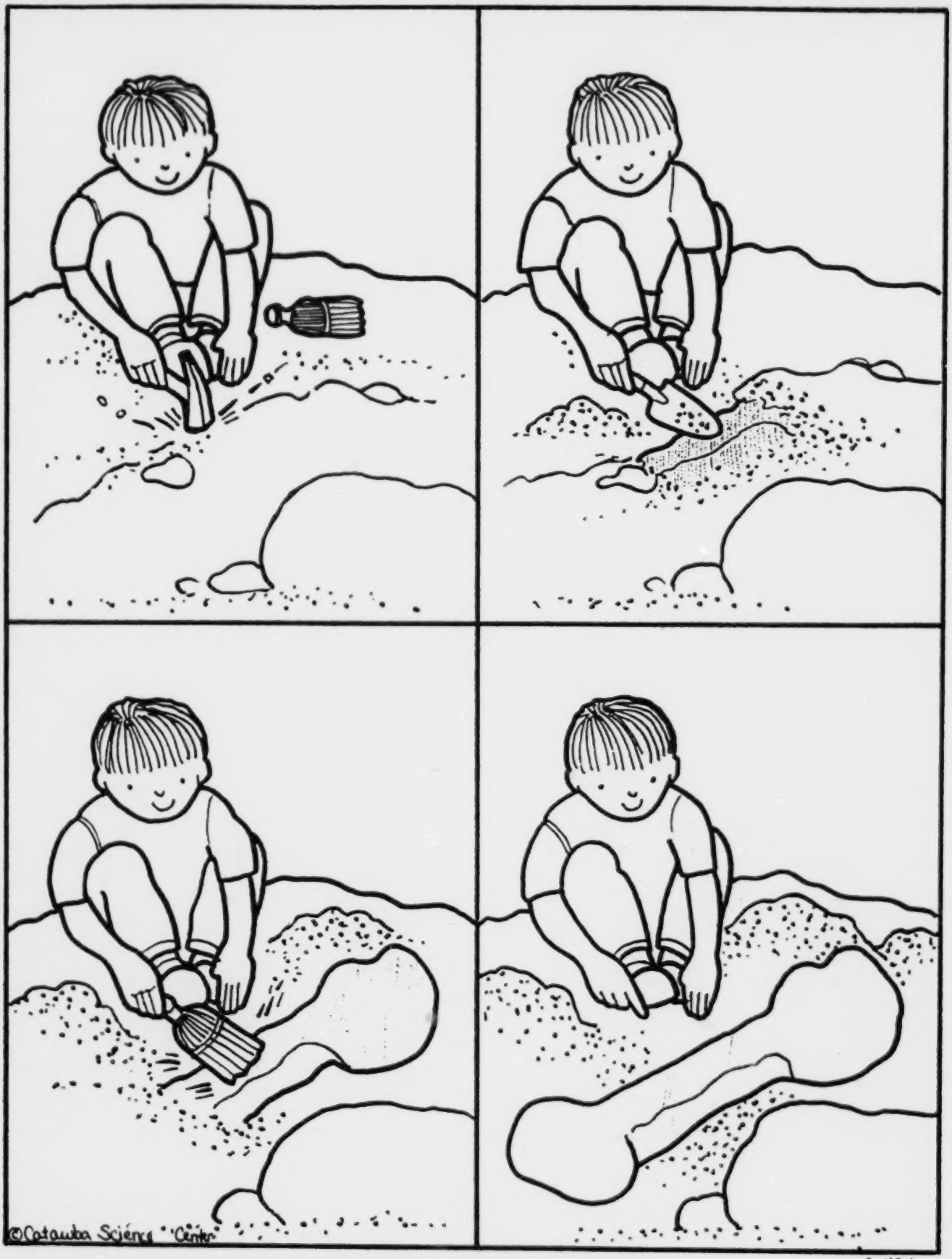

E436

Fossils Tell A Story

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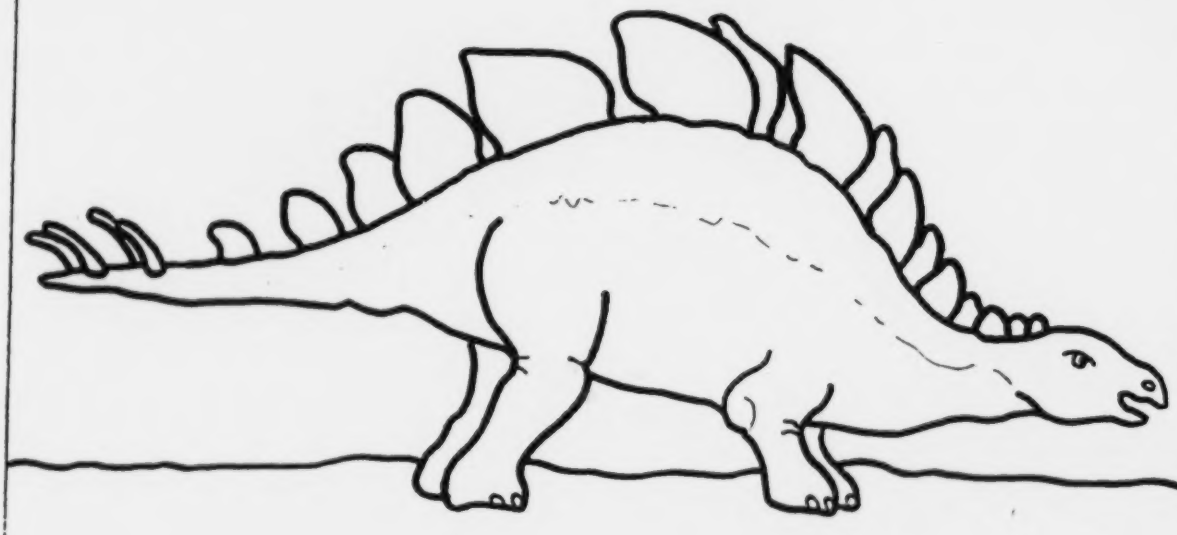

Dinosaurs lived long ago.

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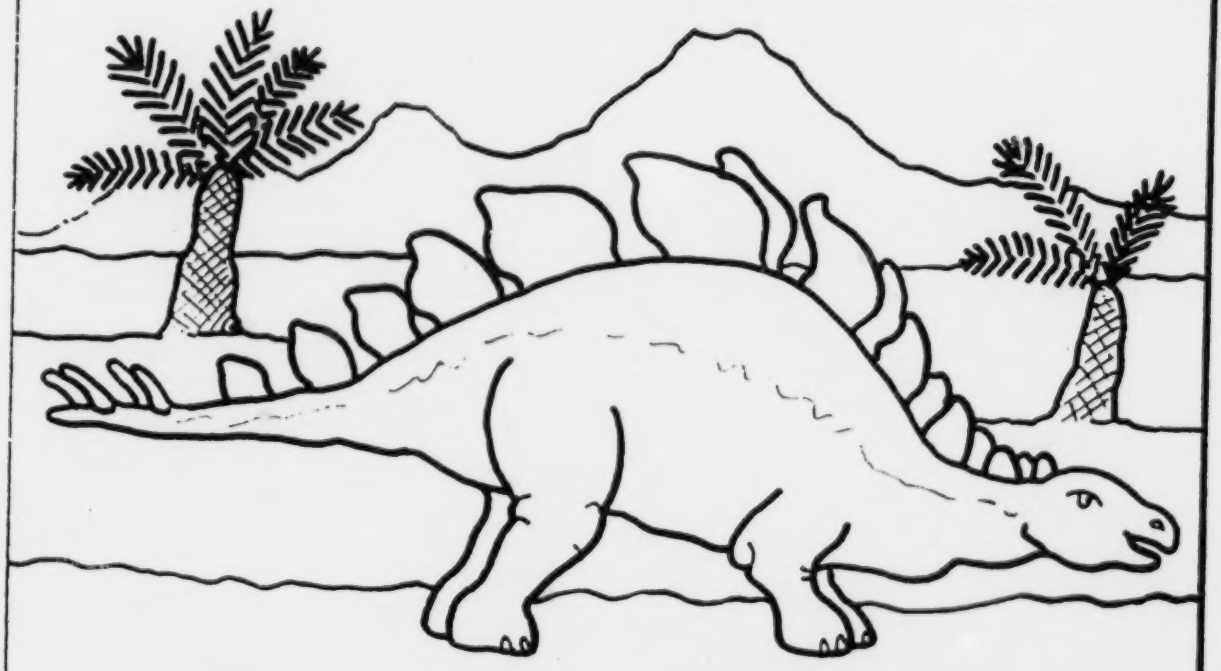
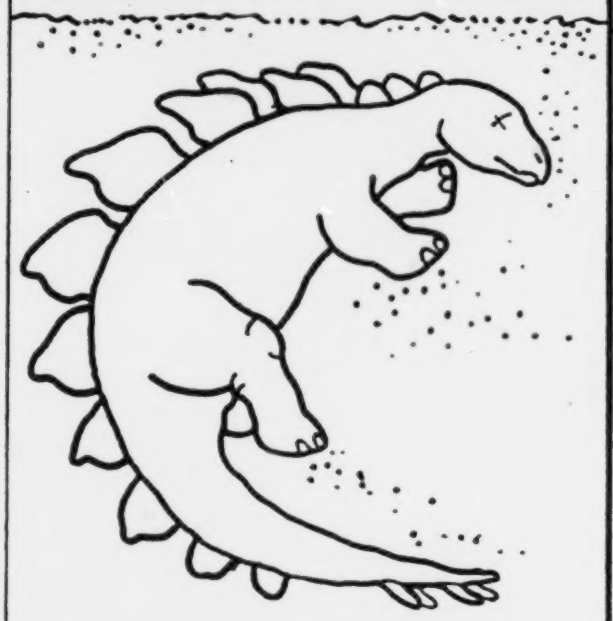
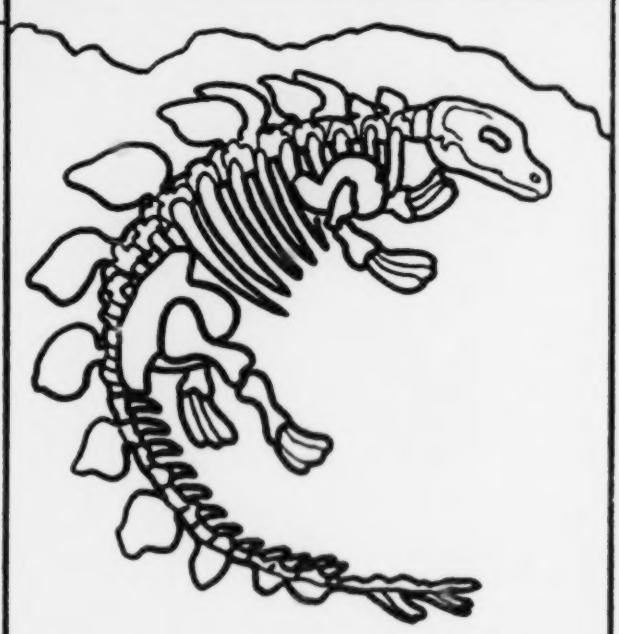


People did not live
when dinosaurs lived.

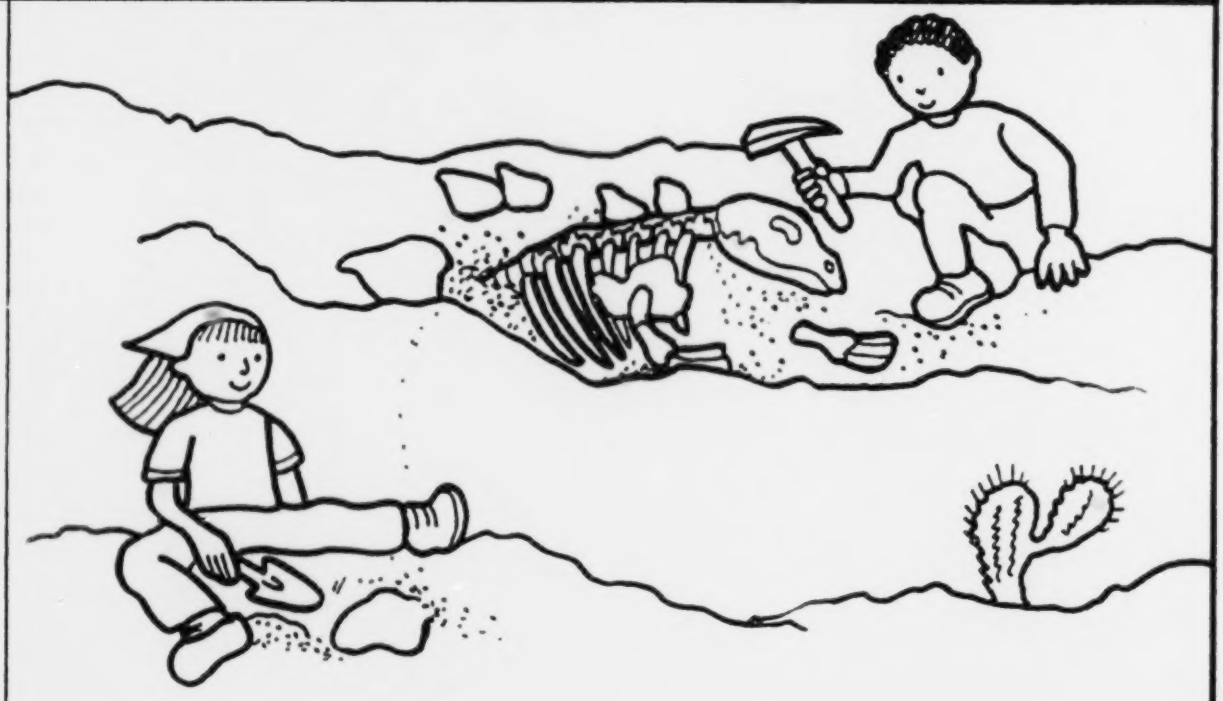
E 437



When some dinosaurs died, their bones lay in mud or in sand.



After a long time, their bones became special rocks called fossils.



Today, people dig for the fossil bones.

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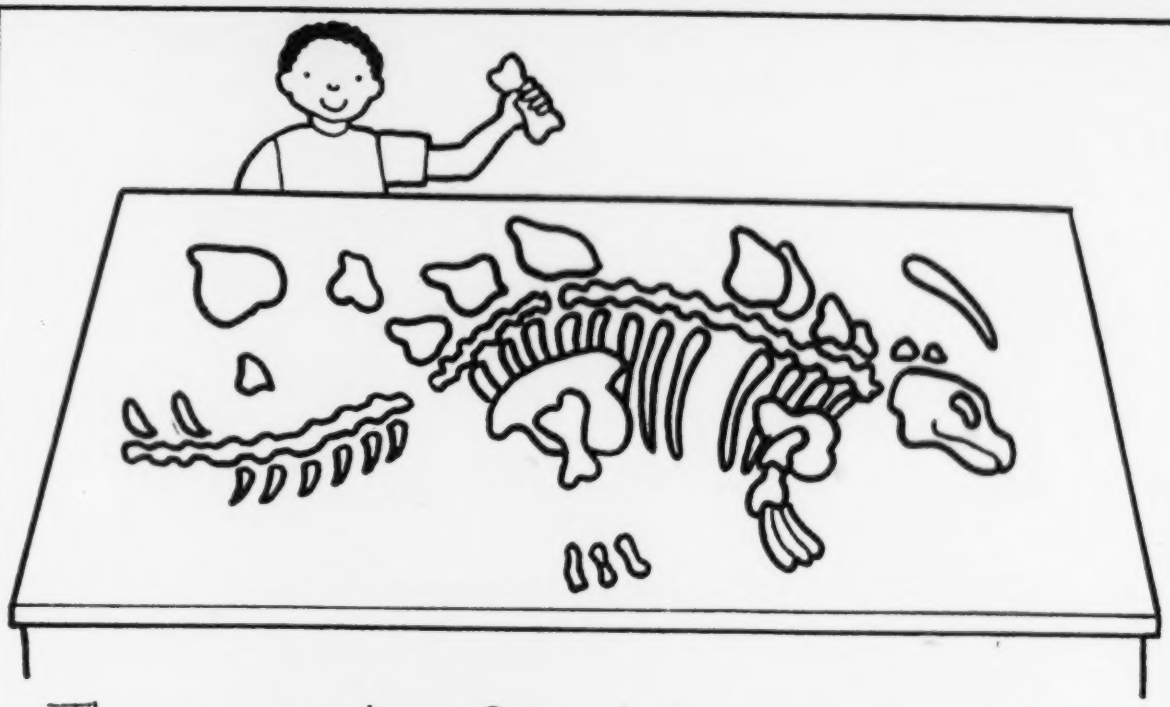
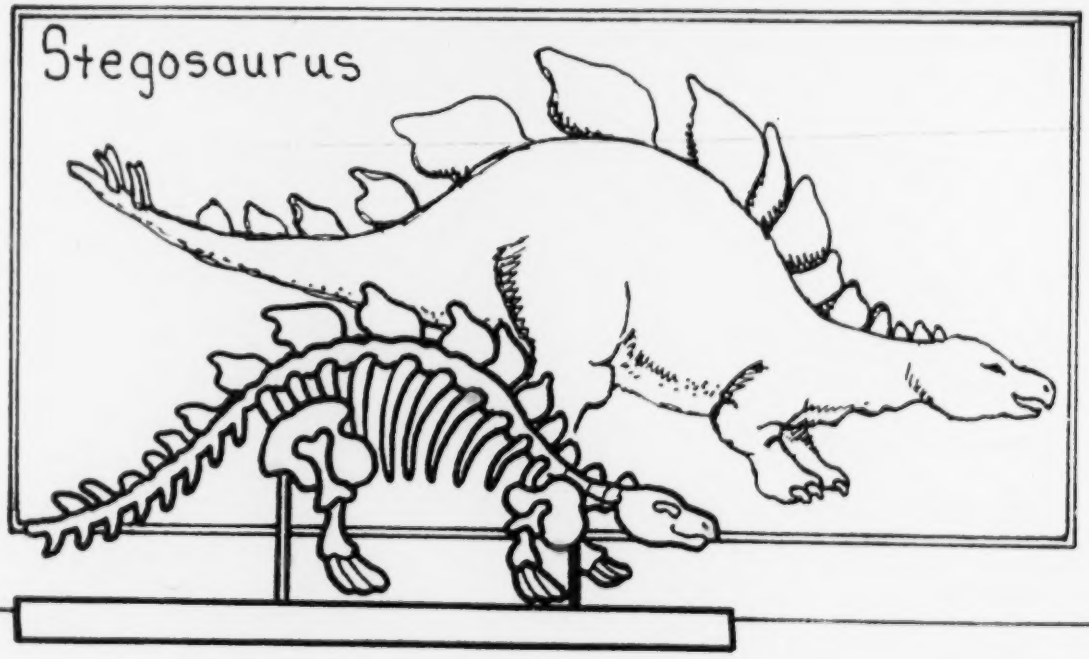


They put the fossil bones together like a puzzle.



That's how we know what dinosaurs might look like.

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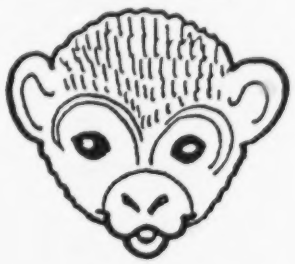
E 437

Rain Forest Animals

©Catawba Science Center

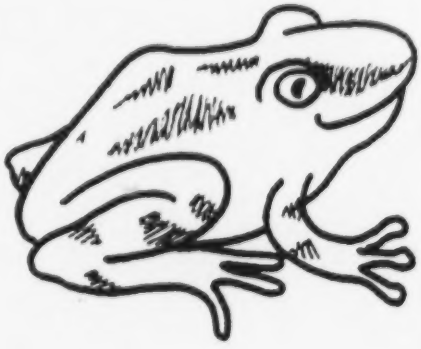
The End



monkey

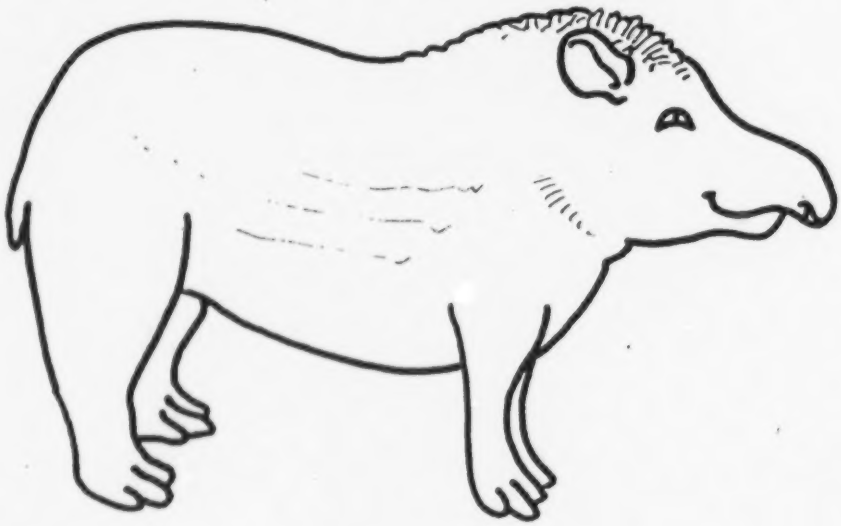
©Catawba Sciences Center

frog



E 442

tapir



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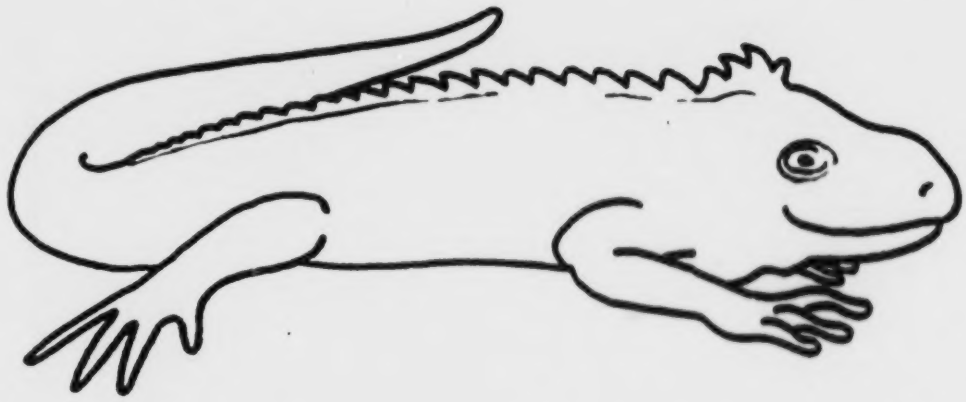
macaw

E442

iguana



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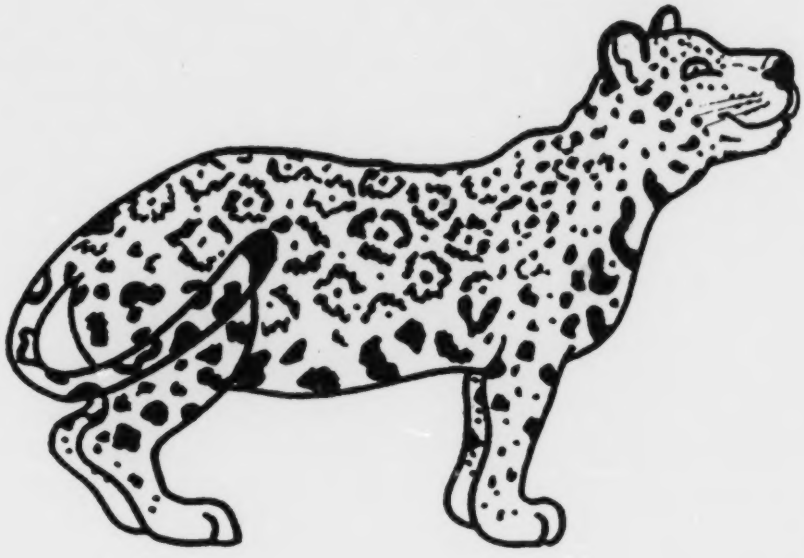
jaguar



E442

Let's
Conserve
Air, Land and Water

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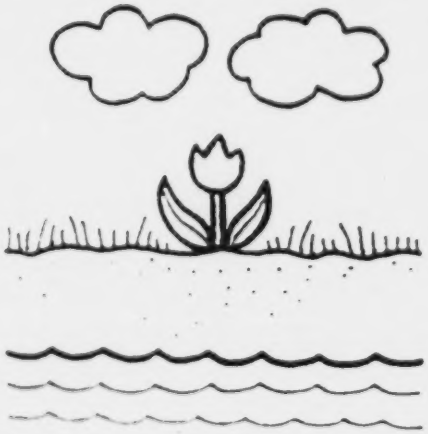
The End



BEST COPY AVAILABLE

E 443

Don't use aerosol spray.

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Ride a bike!

E443

Trash
Don't pollute streams.
©Catawba Science Center
Save water!

E 443

Don't litter the ground.

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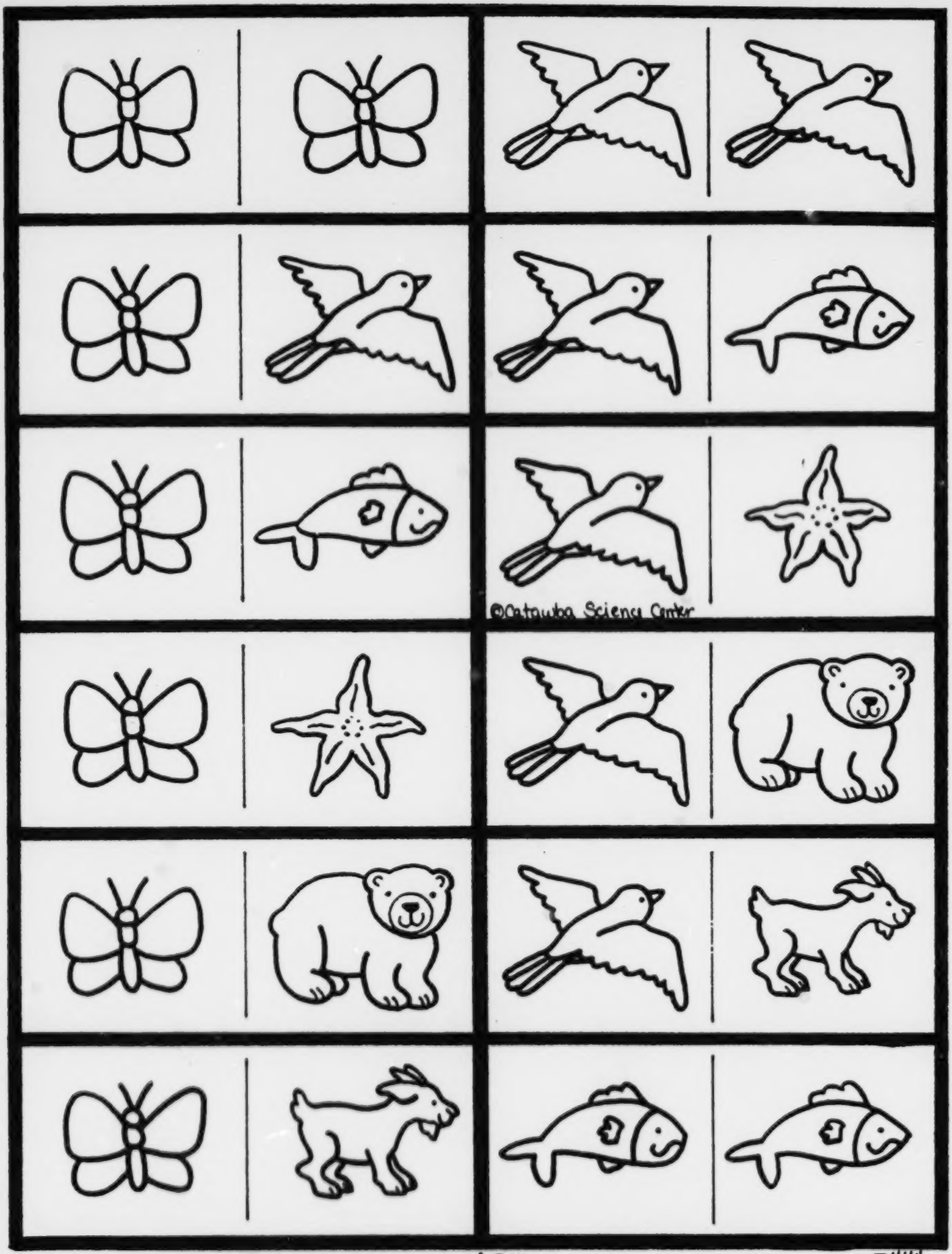
Plant a tree!

E443



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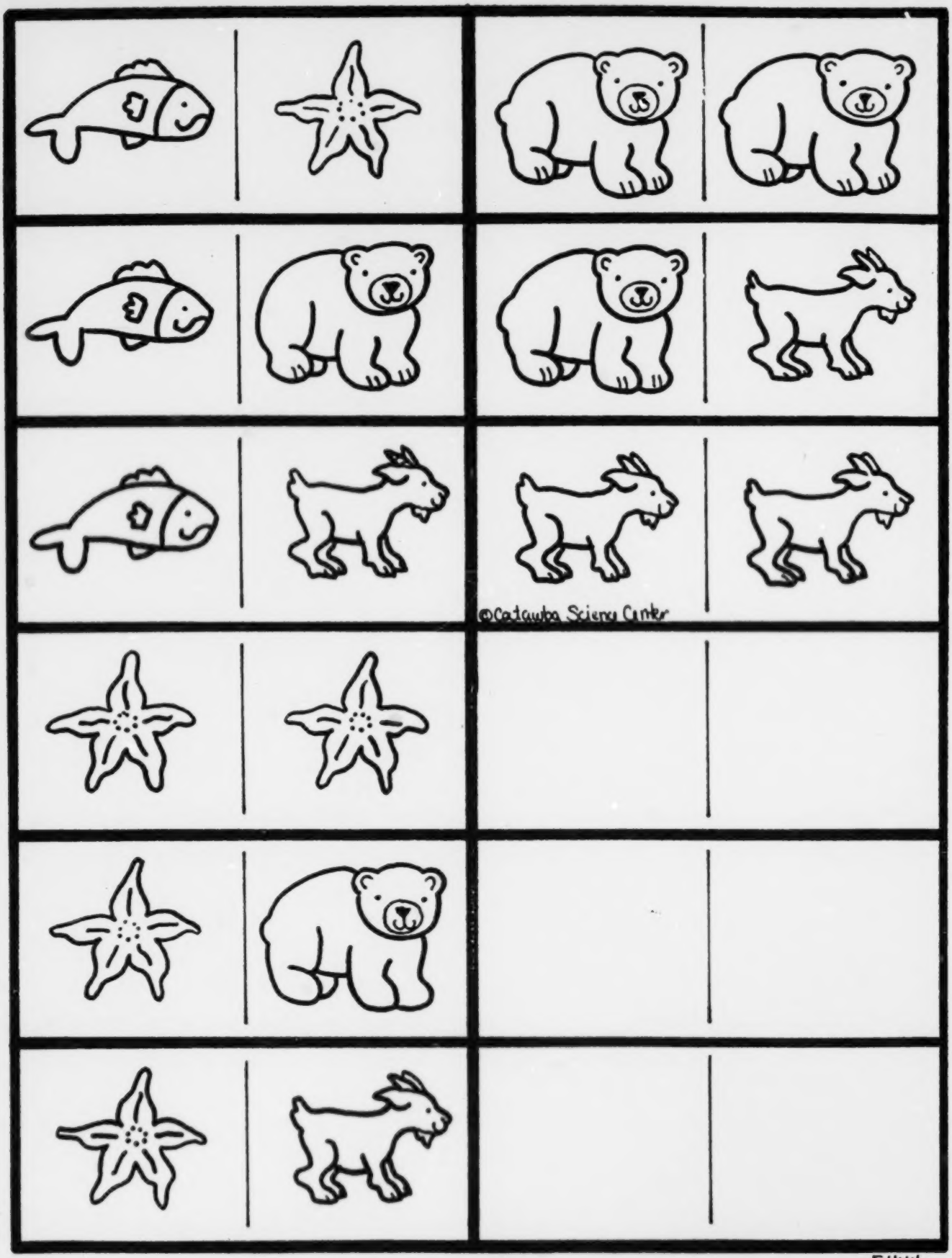
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I can conserve by...

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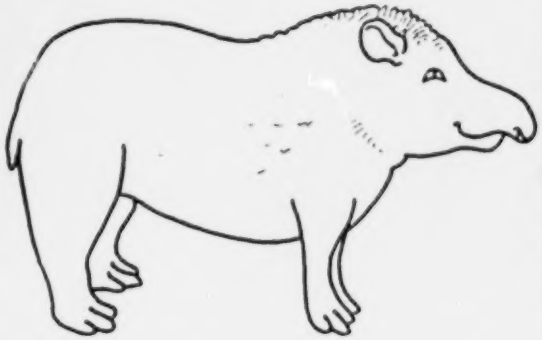

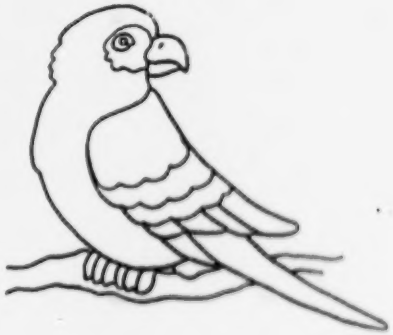

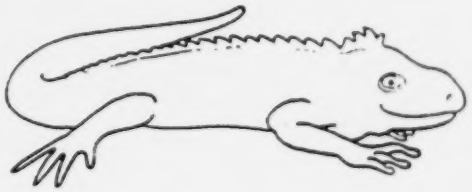

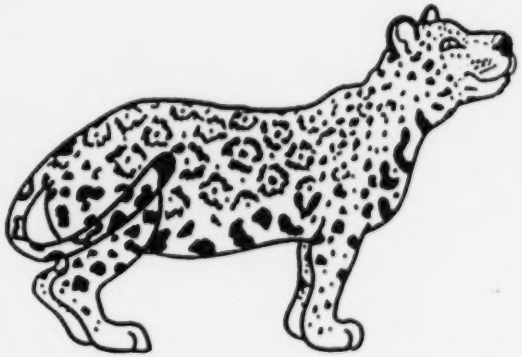

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E446

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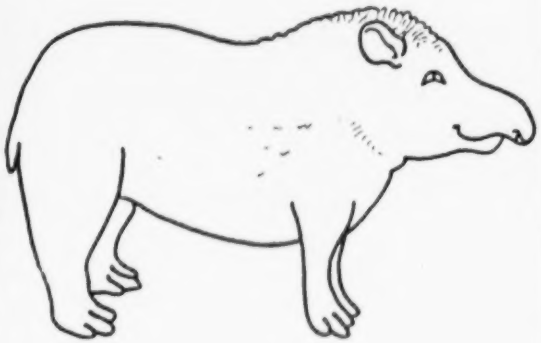

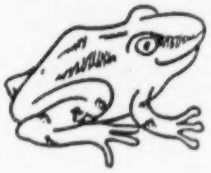

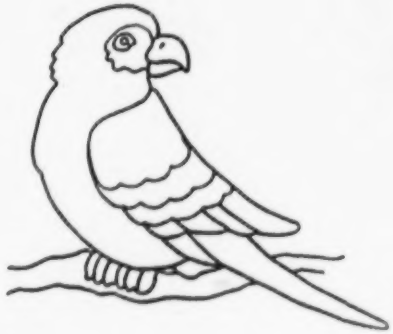

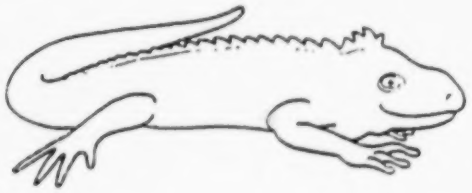

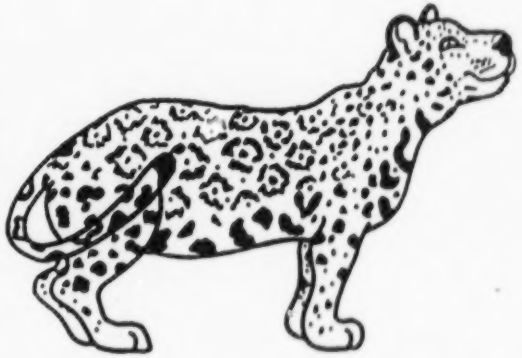

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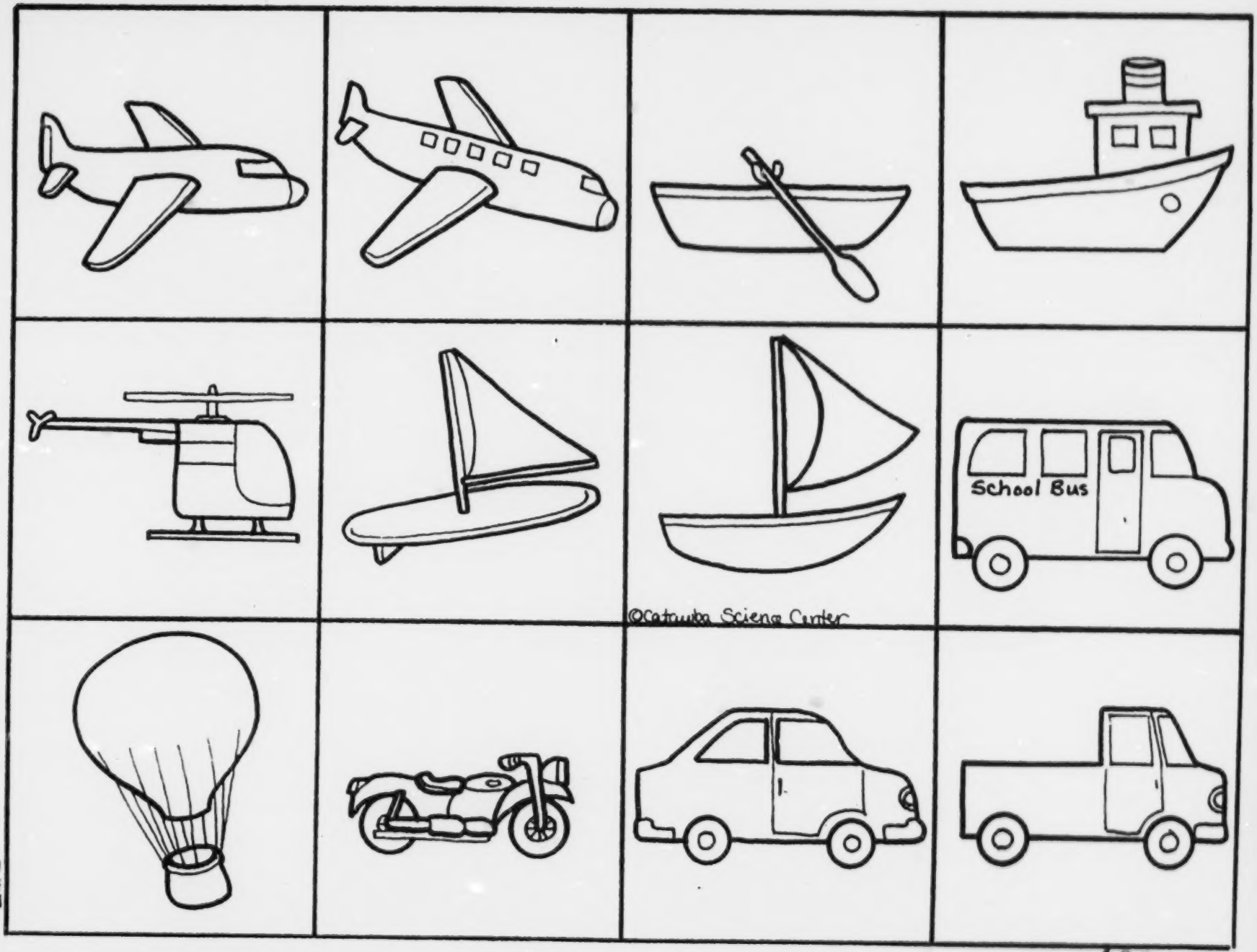
School Bus
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Unit 3

Transportation

air	land	water

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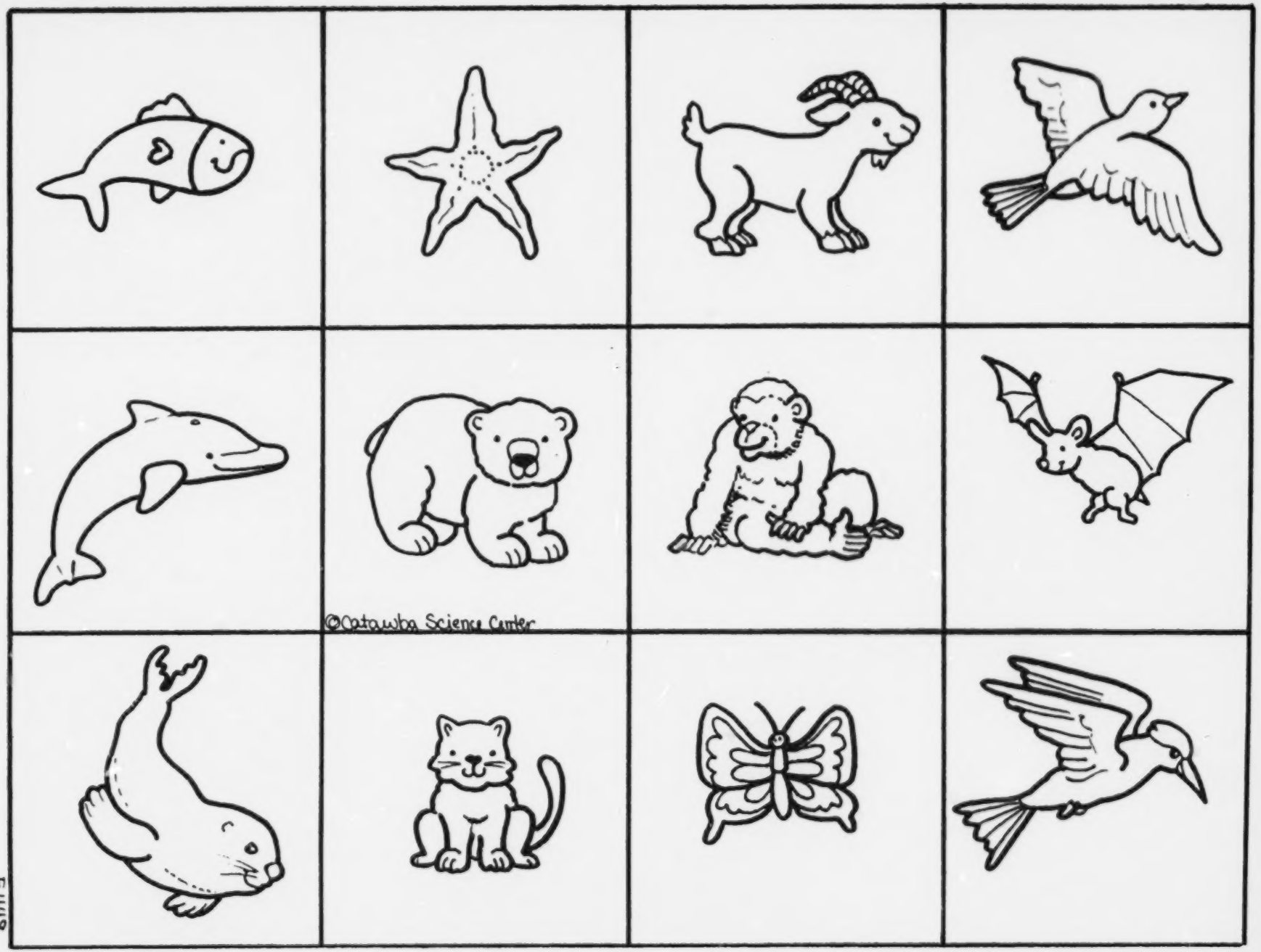
LH3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Animals

air	land	water

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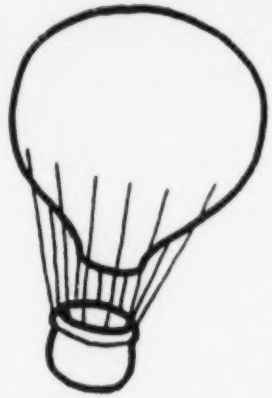

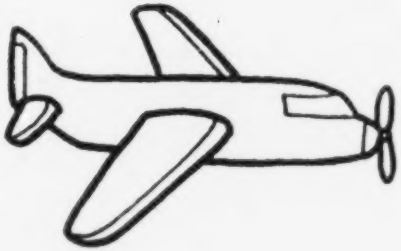

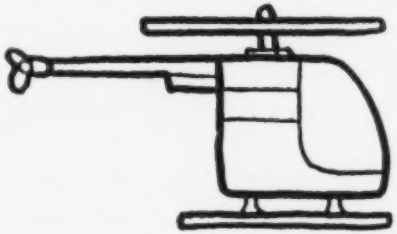

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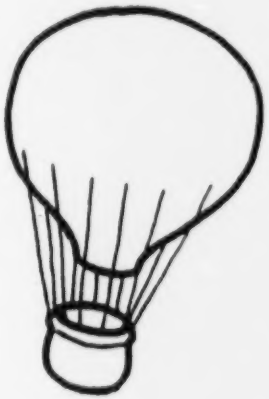

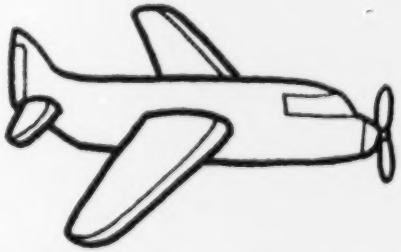

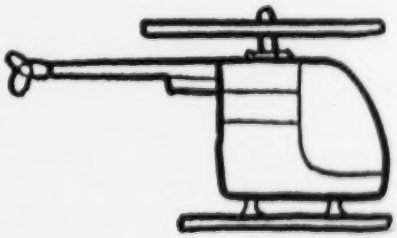

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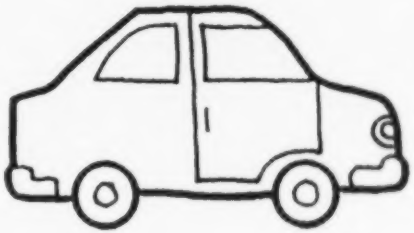

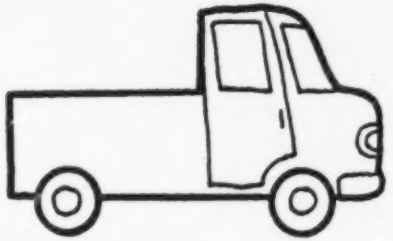

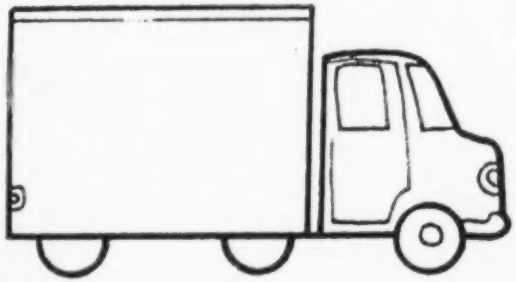

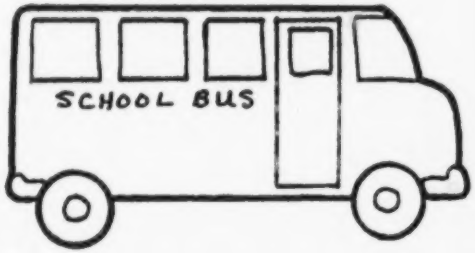

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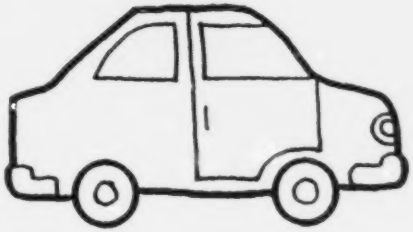

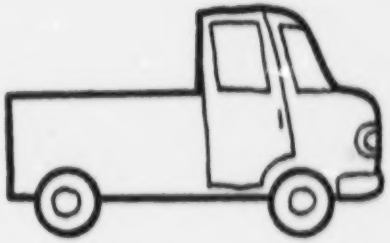

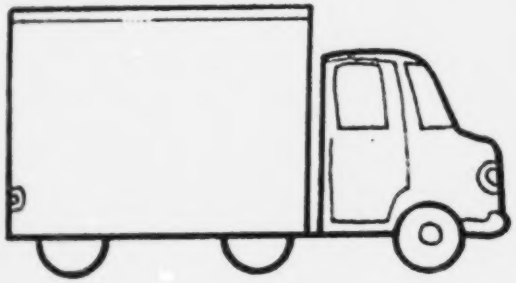

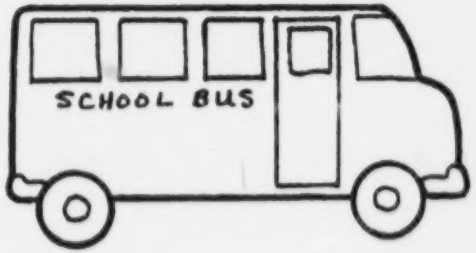

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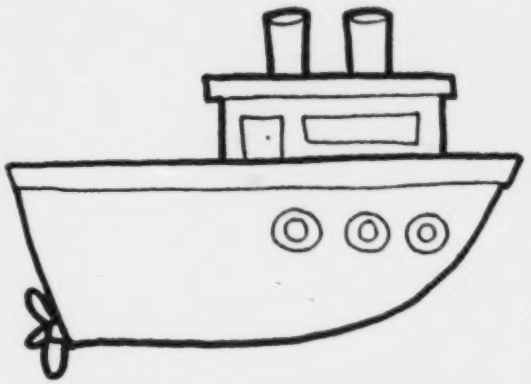

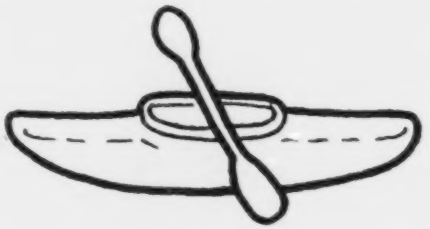

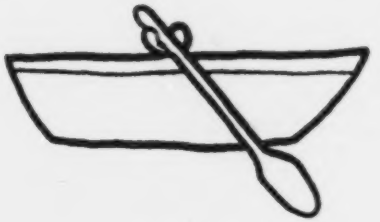

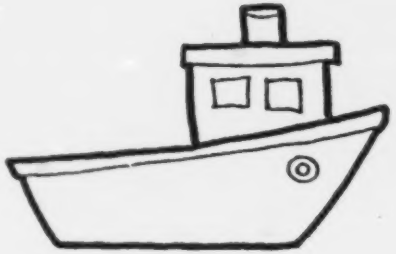

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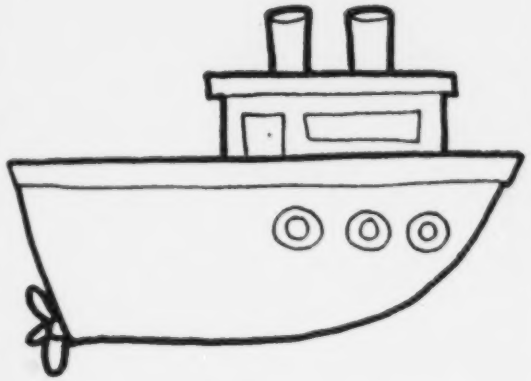

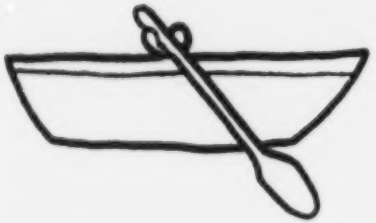

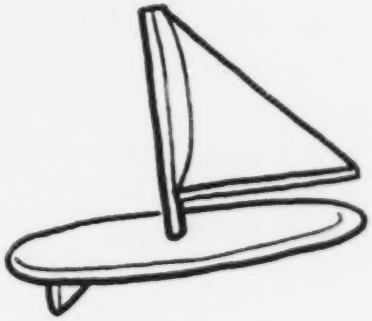

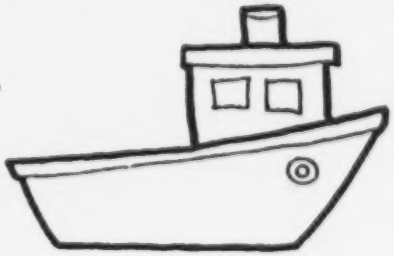

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Earth Science

Books and Fingerplays

Three-Year-Olds
Four-Year-Olds

Earth
Books

Water **written by Alfred Leutscher**

Water **written by Angela Webb**

Snow Is Falling **written by Frankly M. Branley**

Floating and Sinking **written by Franklyn M. Branley**

Dinosaur Bones **written by Aliki**

My Visit to the Dinosaurs **written by Aliki**

Fossils **written by Allan Roberts**

Air is all around you **written by Frankly M. Branley**

The Wind Is Air **written by Mary Brewer**

Air **written by Angela Webb**

Volcanoes **written by Seymour Simon**

A First Look at Rocks **written by Joyce Hunt and Millicent E. Selsam**

Rocks and Minerals **written by Illa Podendorf**

Earth **written by Alfred Leutscher**

Soil **written by Angela Webb**

If You Are A Hunter of Fossils **written by Byrd Baylor**

I Can Be A Geologist **written by Paul P. Sipiera**

Everybody Needs A Rock **written by Byrd Baylor**

Rock Collecting **written by Roma Gans**

Rocks in my Pocket **written by Marc Harshman**

The Rock Quarry Book written by Michael Kehoe

The Rock written by Peter Parnall

Finding the Green Stone written by Alice Walker

The Hill and the Rock written by David McKell

On my beach there are many pebbles written by Leo Lionni

Mr. Meredith and the truly remarkable stone written by Grace Chetwin

Water is Wet written by Penny Pollock

Puddles and Ponds written by Rose Wyler

Follow the water from brook to ocean written by Arthur Dorros

Water's Way written by Lisa Westberg Peters

Gilberto and the Wind written by Marie Hall Ets

Feel the Wind written by Arthur Dorros

Earth Science
Songs and Fingerplays
Resources

More Piggy Back Songs by Jean Warren, 1984
Old Volcano

Piggy Back Songs by Jean Warren, 1984
Trash
I See the Wind

The following fingerplay/songs were written by Karla Payne, MA

Dig, Dig, Dig (Sung to "Row, Row, Row Your Boat")

Dig, dig, dig the ground.
Look for rocks today.
Some are big, and some are small.
Find them anyway.

Air Is All Around Us (Sung to "Frere Jacques")

Air is all around us, air is all around us.
It takes up space. It takes up space.

You can feel it everywhere, you can feel it everywhere.
Feel the air, feel the air.

Let's Dig Rocks (Sung to "Frere Jacques")

Let's dig rocks, let's dig rocks.
Now let's sort them, now let's sort them.
These two are the same, these two are the same.
These are different. These are different.

What Will Float (Sung to "Row, Row, Row Your Boat")

What, what, what will float?
We can't wait to see.
How many things will float in the water?
One, two, three.

Water Freezes (Sung to "London Bridge")

Water freezes when it's cold,
When it's cold, when it's cold.
Water freezes when it's cold.
It turn to hard, hard ice.